MOTOROLA test equipment

portable test set

MODELS S1056A/B S1057A/B
S1058A/B S1059A/B

68P81011A01-K

Motorola Communications Group Parts Department

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PORTABLE TEST SET

MODELS S1056A/B
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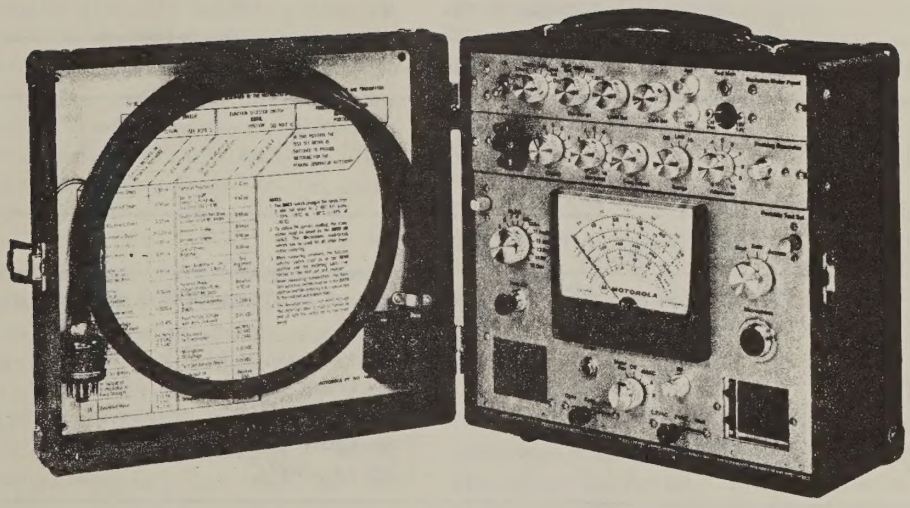

S1059A/B PORTABLE TEST SET

MOTOROLA INC. *Communications Division*
ENGINEERING PUBLICATIONS 1301 E. ALGONQUIN ROAD SCHAUMBURG, ILLINOIS 60172

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68P81011A01
Issue - K

GUARANTEED PERFORMANCE SPECIFICATIONS

PORTABLE TEST SET

MODELS	S1056A/B, S1057A/B, S1058A/B and S1059A/B
ALIGNMENT	Metering facilities for alignment of receiver and tune-up of transmitter through a single, 11-pin plug and cable.
RECEIVER OUTPUT	Accurate measurement of output voltage for receiver quieting measurement. Self-contained PM speaker permits audio reception.
IF PEAKING	Transistorized i-f oscillator provides output from 350 kc to 13 mc when used with appropriate crystals.
CRYSTAL TESTING	Activity of crystals between 350 kc and 13 mc may be checked.
FIELD INTENSITY METER	Relative values of the r-f field intensity radiated from the transmitter antenna may be measured.
RF WATTMETER	Accurate measurement of transmitter power output with optional calibrated dummy load.
METER	0-50 microamps; 2% full scale accuracy
TRANSISTOR COMPLEMENT AND FUNCTION	(1) oscillator (2) AC voltmeter ampl.
POWER SUPPLY	four 1-1/2 volt "D" batteries
AC VOLTMETER	Accurately measures audio input to transmitter and audio output of receiver Range: 0 to .2 v a-c; 0 to 2 v a-c Frequency Response: ±1 db from 35 cps to 5000 cps Input Impedance: 2 v range 400,000 ohms; .2 v range 40,000 ohms Stability: -1 db from -5°C to +60°C -3 db at -30°C
SIZE	12-1/2" high x 12" wide x 6-1/2" deep
WEIGHT	11 lbs.

FOREWORD

1. SCOPE OF MANUAL

This manual is intended for use by experienced technicians familiar with similar types of equipment. It contains all service information required for the equipment described and is current as of the printing date. Changes which occur after the printing date are incorporated by Instruction Manual Revisions (SMR). These SMR's are added to the manuals as the engineering changes are incorporated into the equipment.

2. MODEL AND KIT IDENTIFICATION

Motorola equipments are specifically identified by an overall model number on the nameplate. In most cases, assemblies and kits which make up the equipment also have kit model numbers stamped on them. When a production or engineering change is incorporated, revision suffix numerals are added to the affected kit model number. For example, a TLN4448A becomes a TLN4448A-1 with the first revision, TLN4448A-2 with the second revision, etc.

As diagrams are updated, information about the change is incorporated into a revision column. This revision column appears in the manual up issue next to the parts list or, in some cases, on the diagram. It lists the reference number, part number, and description of the parts removed or replaced when the suffix number changed. With this information, the technician can find the information for the current version, and any previous version, of the equipment covered by the manual.

3. SERVICE

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National Service Manager
Motorola Communications Division
1301 E. Algonquin Road
Schaumburg, Ill. 60172

4. REPLACEMENT PARTS ORDERING

Motorola maintains a number of parts offices strategically-located throughout the United States. These facilities are staffed to process parts orders, identify part numbers, and otherwise assist in the maintenance and repair of Motorola Communications Division products.

Orders for all parts except crystals, channel elements, and "Vibrasender"® and "Vibrasponder"® resonant reeds should be sent to the nearest area parts center. Orders for instruction manuals should also be sent to the area parts and service center.

When ordering replacement parts or equipment information, the complete identification number should be included. This applies to all components, kits, and chassis. If the component part number is not known, the order should include the number of the chassis or kit of which it is a part, and sufficient description of the desired component to identify it.

Orders for crystals, channel elements, and reeds should be sent directly to the factory address listed below. Crystal and channel element orders should specify the crystal or channel element type number, crystal and carrier frequency, and the chassis model number in which the part is used.

Orders for "Vibrasender" and "Vibrasponder" resonant reeds should specify type number and frequency, and should identify the owner/operator of the communications system in which these items are to be used.

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5. ADDRESSES

5.1 GENERAL OFFICES

MOTOROLA INC.
Communications Division Parts Dept.
1313 E. Algonquin Rd.,
Schaumburg, Illinois 60172
Phone: 312-397-1000
Executive Offices: 1301 E. Algonquin Rd.,
Schaumburg, Illinois 60172

5.2 U.S. ORDERS

WESTERN AREA PARTS
1170 Chess Drive, Foster City,
San Mateo, California 94404
Phone: 415-349-3111
TWX: 910-375-3877

MIDWEST AREA PARTS
10 N. North Ave.,
Lombard, Ill. 60148
Phone: 312-620-3000
TWX: 910-693-1592

MID–ATLANTIC AREA PARTS
6701 Elkridge Landing Road,
Linthicum, Maryland 21090
Phone: 301-796-8600

EAST CENTRAL AREA PARTS
12995 Snow Road,
Parma, Ohio 44130
Phone: 216-267-2210
TWX: 810-421-8845

EASTERN AREA PARTS
85 Harristown Road,
Glen Rock, New Jersey 07452
Phone: 201-447-4000
TWX: 710-988-5602

PACIFIC SOUTHWESTERN AREA PARTS
2333 Utah Avenue,
El Segundo, California 90245
Phone: 213-644-1101
TWX: 910-348-6278

SOUTHWESTERN AREA PARTS
3320 Belt Line Road,
Dallas, Texas 75234
Phone: 214-241-2151
TWX: 910-860-5505

SOUTHEASTERN AREA PARTS
5096 Panola
Industrial Blvd.
Decatur, Georgia 30032
Phone: 504-981-9800
TWX: 810-751-8300

5.3 CANADIAN ORDERS

CANADIAN MOTOROLA ELECTRONICS COMPANY
Parts Department
3125 Steeles Avenue,
East Willowdale, Ontario
Phone: 416-499-1441.
TWX: 610-492-2713
Telex: 02-29944LD

5.4 ALL COUNTRIES EXCEPT U.S. AND CANADA

MOTOROLA, INC. OR MOTOROLA AMERICAS, INC.
International Parts
1313 E. Algonquin Road
Schaumburg, Illinois 60172 U.S.A.
Phone: 312-397-1000
TWX: 910-693-1592 or 1599
Telex: 722443 or 722424
Cable: MOTOL

5.5 FACTORY ADDRESS FOR CRYSTAL, CHANNEL ELEMENT AND RESONANT REED ORDERS

AIR MAIL ORDERS
Motorola, Inc.
Component Service Department
P.O. Box 66191
O'Hare International Airport
Chicago, Ill. 60666

REGULAR MAIL ORDERS AND CORRESPONDENCE
Motorola, Inc.
Component Service Department
2553 Edgington Street
Franklin Park, Illinois 60131

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MOTOROLA

MODEL CHART

FOR

PORTABLE TEST SET

CODE:

X = ONE ITEM SUPPLIED

2 = TWO ITEMS SUPPLIED

4 = FOUR ITEMS SUPPLIED

MODEL	DESCRIPTION	ITEM	DESCRIPTION	REFERENCE DIAGRAM
		SLN6056A/B	PORTABLE TEST SET KIT	63E81011A03
		SLN6057A/B	PEAKING GENERATOR KIT	63E81011A06
		SLN1000A/B	DEVIATION METER	63D81011A08
		SLN6082A/B	BATTERY KIT	
		SLN6046A/B	BATTERY KIT	
		SLN6060A/B	BLANK PANEL KIT	
		SLN6061A/B	BLANK PANEL KIT	
		SAN6000A	DEVIATION METER ANTENNA	
		SLN6080A	ATTENUATOR KIT	
		SKN6007A	CABLE KIT	
S1056A/B	PORTABLE TEST SET	X	4	X X
S1057A/B	PORTABLE TEST SET WITH PEAKING GENERATOR	X X	4	X
S1058A/B	PORTABLE TEST SET WITH DEVIATION METER	X X	4 2	X X X
S1059A/B	PORTABLE TEST SET WITH PEAKING GENERATOR & DEVIATION METER	X X X	4 2	X X X

EPD-8143-A

PORTABLE TEST SET

1. INTRODUCTION

The Motorola Portable Test Sets provide the metering necessary to align and check Motorola transmitters and receivers in the 25-960 mc frequency range.

The test set housing is a convenient carrying case with a removable front cover. Clips mounted in the front cover hold the metering cable when carrying the test set. The accessories supplied with the test set can be stored in the meter protective cover, inside the test set, which is accessible by twisting the two quarter turn screws and opening the front panel.

The Model SLN6057A/B Peaking Generator, used in the S1057A/B and S1059A/B Test Sets, is available as a separate item for mounting in all models not equipped with a peaking generator.

The Model SLN1000A Deviation Meter Panel, used with the S1058A/B and S1059A/B Test Sets, is available in the Model S1062A/B Conversion Kit for mounting in all models not equipped with a deviation meter.

Operating voltage for the test set is supplied by an internal 6 volt d-c source consisting of four 1-1/2 volt "D" batteries connected in series.

The test sets incorporate the following performance features:

- Direct reading multi-scale meter
- Transistorized a-c voltmeter
- Transistorized oscillator
- Selection of metering circuits in transmitters and receivers
- Zero center scale
- Peaking generator (included in Models S1057A/B and S1059A/B only or available as an optional accessory)
- Deviation Meter (included in Models S1058A/B and S1059A/B only or available as an optional accessory as part of the S1062A/B Conversion Kit).

2. ACCESSORIES SUPPLIED

All models include a metering cable, a 455 kc crystal, an r-f probe, r-f probe extension cable, r-f probe adapter and an accessory cable.

NOTE

If previously supplied metering cables are to be used with this test set, add resistor R31 as shown on the test set schematic diagram. Previously supplied metering cables include: (1) W1 Metering Cable 1V858292 supplied with test set chassis stamped SLN6056A-3 or earlier; (2) Accessory Metering Cables SKN6012A and SKN6013A.

The metering cable has a 20-pin connector which mates with the receptacle on the test set and an 11-pin connector to plug into the meter receptacle on the receiver or transmitter being tested.

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The 455 kc crystal is used for receiver i-f alignment. It plugs into a socket inside the test set.

The r-f probe is a shielded cable with a connector at one end which mates directly with the BNC connector on the r-f probe extension cable. The extension cable mates with the r-f connector on the test set to supply the required r-f for specific testing purposes.

The r-f probe adapter is used with the r-f extension cable to permit the cable to connect directly to the antenna receptacle on the radio set for the r-f source.

The accessory cable is described in paragraph 4e.

3. METERING FACILITIES

The test set meter is calibrated in six different scales. Metering Chart (EPD-7603) which is included with this instruction manual, indicates every meter scale and its application. This chart is largely self-explanatory; however, certain procedures cannot be fully explained on the chart and are described in text form under the RECEIVER METERING PROCEDURES and TRANSMITTER METERING PROCEDURES paragraphs of this instruction manual. All metering not explained in the text can be accomplished by following the metering chart and the alignment procedures described in the instructions supplied with the equipment being tested.

In a receiver, the following stages can be measured: last i-f grid, first limiter grid, second limiter grid, discriminator output, oscillator grid, first oscillator multiplier (450-470 mc and 890-960 mc equipment), second oscillator multiplier (450-470 mc and 890-960 mc equipment), B+ voltage, A+ or filament voltage and audio output.

In a transmitter, the following stages can be measured: multiplier grids, driver grid, final amplifier grid, PA plate current, relative r-f power output (450-470 mc and 890-960 mc equipment), B+ (highest B+ to final amplifier stage), push-to-talk relay voltage, audio input and microphone d-c voltage.

Other measurements which can be made are: internal batteries of the test set, r-f voltage from the i-f oscillator and relative field strength.

The meter scales and applications are as follows:

a. 20 - 0 - 20 ua Scale

The 20 - 0 - 20 ua scale is the top scale on the meter. The "0" center feature of this scale provides direct, accurate readings, both positive and negative, without switching meter polarity. This arrangement simplifies adjustment of receiver discriminator output and improves local oscillator tuning for exact "on-frequency" readings.

b. 0 - 50 ua Scale

The 0 - 50 ua scale is the second scale from the top of the meter. This scale is used for most of the transmitter and receiver alignment requirements. The metering chart indicates the various applications for which this scale is used.

c. 0 - 16 K. C. DEV. Scale

The 0 - 16 K. C. DEV. scale is the third scale from the top of the meter. This scale is used when measuring the deviation of transmitters with 15 KC channel spacing. This scale is also 0 - 1.6 KC and is used for measuring "Private-Line" tones on units equipped with this feature.

d. 0 - 8 K. C DEV. Scale

The 0 - 8 K. C. DEV. scale is the fourth scale from the top of the meter. This scale is used to measure the deviation of transmitters with 5 KC channel spacing.

e. 0 - 1000 Volt DC Scale

The 0 - 1000 volt d-c scale is the fifth scale from the top of the meter. This scale is used primarily for reading B+ voltages in transmitters and receivers.

f. 0 - 15 Volt DC Scale

The 0 - 15 volt d-c scale is the sixth scale from the top of the meter. This scale is used when measuring filament and relay voltages and also the internal power supply of the test set.

g. 0 - 30 Volt DC Scale

The 0 - 30 volt d-c scale is the seventh scale from the top of the meter. This scale is used primarily for measuring microphone d-c voltage.

h. 0 - 2 Volt AC Scale (0 - .2 Volt AC)

The 0 - 2 volt a-c scale is the bottom scale on the meter. This scale is used to measure the audio output of a receiver and the audio input of a transmitter. The meter sensitivity can be changed, by means of a switch on the front of the test set, to indicate a full scale reading of 0.2 volts a-c.

4. CONTROLS

All controls used for testing and aligning are located on the front panel of the test set. These controls are shown on the Controls Location Detail, number EPD-7580, which is included in this instruction manual, and are as follows:

a. Position Selector Switch

The position selector switch is a 15-position switch used to select the circuit to be metered. The correct switch positions are determined by the type of equipment being tested. The Metering Chart, EPD-7603, included in this manual, indicates the switch positions in relation to the circuits. Refer to the instruction manual supplied with the radio set for switch positions to be used.

The following chart shows the relationship between the selector switch positions of previous Motorola Test Sets compared with those of the Models S1056A/B, S1057A/B, S1058A/B, and S1059A/B. An asterisk in the chart indicates there is no switch position on the P-8500 and P-8501 series comparable to the S1056A/B-9A/B.

RECEIVER	P-8500 & P-8501 Series	1	2	3	+4, -4	5	6	-4 (see note)	5 (see note)	7	*	8	*	*	*	*
	S1056A/B-9A/B	1	2	3	4	5	6	7 PA	8 PO	B+ 9	A+ 10	Audio 11	12	13	14	15
TRANSMITTER	P-8500 & P-8501 Series	1	2	3	-4	5	6	+4	1	7	8	*	*	*	*	*
	S1056A/B-9A/B	1	2	3	4	5	6	7 PA	8 PO	B+ 9	A+ 10	Audio 11	12	13	14	15

Note: The K-9326 Adapter Plug must be used.

b. Function Selector Switch

The function selector switch is labeled RCVR - XMTR - ACCESS. The switch should be placed in the RCVR position when metering a receiver and the XMTR position when metering a transmitter. The switch should be placed in the ACCESS position when metering accessory equipment.

c. XMTR ON Switch

The XMTR ON switch is used when measuring transmitter power amplifier (PA) current. Transmitter PA current can be measured only by pressing the XMTR ON switch and not by operating the push-to-talk button on a microphone connected to the test set.

d. SPKR Switch

The SPKR switch is labeled OPEN - SPKR - LOAD. In the OPEN position, a 30 ohm load is placed across the receiver output. In this position, the speaker on the test set is in operating condition, at reduced level, and messages can be heard. The main function of this switch position is to set the GAIN control on a receiver from the trunk of an automobile without double-loading the receiver output. In the SPKR position, which is the normal position of the switch, the speaker on the test set is in operating condition and messages can be heard. In the LOAD position a 3 ohm resistive load is placed across the receiver audio output, which disables the test set speaker.

e. METER Phone Jack

The accessory cable supplied is used when metering certain types of Motorola equipment. The red plug on the cable mates with the METER receptacle on the test set; the black plug mates with the phone-jack on the receiver or transmitter being metered. Motorola equipment with a phone-jack metering receptacle has a switch on the receiver and transmitter chassis to select the circuit to be metered. The accessory cable is also used for measuring transmitter r-f power output with the P-7208 Series Dummy Load.

f. Oscillator and Metering Reversing Switch

The oscillator and meter reversing switch is labeled METER REV. - OFF - 455 KC - A - B.

The METER REV. position is used to reverse the polarity of the meter to provide an on-scale reading when the needle tends to indicate in the negative direction past zero.

The OFF position is the normal position used for most applications of the test set. If the switch is in the METER REV. position and then placed in the OFF position, the polarity of the meter will be reversed.

In the 455 KC position, a signal of 455 kc is generated by the test set. This signal is used for measuring the grid of the last i-f amplifier and the discriminator input of a receiver. A 455 kc crystal is supplied with the test set.

The A and B positions are also used for crystal selection. Position A selects the crystal inserted in the "A" terminals of the crystal socket in the test set. Position B selects the crystal inserted in the "B" terminals of the crystal socket in the test set. The oscillator in the test set is capable of operation up to 12 mc. Normally, the three crystals used will be 455 kc, 5.5 mc and 12 mc. These crystals will cover the three most commonly used i-f frequencies.

g. RF Connector

The output of the test set r-f oscillator is available at the r-f connector. The r-f extension cable mates directly with the RF connector. The extension cable is used to couple the signal into the antenna connector of the receiver under test. The probe is used to inject the signal into the various stages of the receiver, as required by the alignment procedure.

h. Multiplier Switch

The multiplier switch is labeled 0.2 VAC - 2 VAC - MULT.

The 2 VAC position is the normal position of the switch. The 0.2 VAC and the 2 VAC refer to the bottom scale of the test set meter. Normally the scale reads 2 volts a-c full scale. If the switch is placed in the 0.2 VAC position, the sensitivity of the meter will be increased 20 db and the scale will be 0.2 volts a-c full scale.

The MULT position is used only when measuring the oscillator multipliers in 450-470 mc and 890-960 mc equipment.

CAUTION

DO NOT use the MULT position for metering 25-54, 72-76 or 132-174 mc receivers. These receivers do not have oscillator multipliers; the meter could be damaged in the MULT position with these receivers.

i. MICROPHONE Connector

The MICROPHONE connector is a four-pin female receptacle which mates directly with any Motorola microphone (or equivalent) which has a four-pin male microphone connector.

j. Metering Socket

The metering socket is a 20-pin male plug. The metering cable, supplied with the test set, connects directly to the metering socket.

k. Speaker

The speaker is used for all applications which may require audible indications for adjustment or checking purposes.

5. RECEIVER METERING PROCEDURES

Most Motorola FM communications receivers incorporate either an 11-pin metering plug or a phone-jack mounted on the receiver chassis. Receivers which do not have the meter plug or phone-jack have no special facilities for metering purposes. When measuring the latter type of receivers refer to the alignment chart supplied with the receiver.

NOTE

The 20-pin metering cable plug acts as the internal battery ON-OFF switch. Pins 19 and 20 on the plug are jumpered. Connecting the plug to the test set socket completes the battery circuit. To conserve battery life when not using the test set either (1) disconnect meter cable from test set, or (2) set the Oscillator and Meter Reversing Switch to OFF and put Position Selector Switch to any position except 11 or 13.

a. Receivers Incorporating an 11-pin Metering Plug

The Metering Chart, EPD-7603, included in this instruction manual, lists all of the stages which can be measured in a receiver incorporating an 11-pin metering socket. As an example, with the Position Selector Switch in position 1, the procedure is as follows:

(1) Last IF Stage Alignment

The circuit to be metered is the grid of the last i-f stage. When the metering cable is plugged into the socket on the front panel the meter is connected across pins #1 and #11 on the 20-pin plug and pins #1 and #11 on the 11-pin plug of the metering cable. At the same time a resistance of 18,000 ohms, in the test set, is placed in series with the meter. The scale to read is the 0-50 ua scale.

The crystal oscillator is used to align receiver i-f sections ranging from 350 kc to 13 mc. The crystal employed must have the same frequency or sub-harmonic of the i-f section being aligned. The frequency of the crystal must be calculated from the formulas given in Table 1. Internal sockets are available to plug-in the AQL, ANL, and/or AUL type crystals, within the frequency range specified above.

A 455 kc crystal is supplied with the equipment. Other crystals must be ordered separately. Table 2 lists the frequency ranges of different types of available crystals. Having calculated the crystal frequency needed, the crystal type number may be selected from this table. When ordering, specify both the crystal frequency and crystal type number. Refer to the receiver block diagram supplied with the receiver for the i-f frequencies required for alignment.

TABLE 1

Crystal Calculations for the Portable Test Set (Crystal calculation information for the peaking generator and deviation meter is contained in their respective sections.)

Fc = Desired test set output frequency
Fx = Crystal frequency required

Fc	Fx
290-800 kc	$Fx = Fc$
800-1600 kc	$Fx = \frac{Fc}{2}$
1600-2000 kc	$Fx = \frac{Fc}{3}$
2-13 mc	$Fx = Fc$

TABLE 2

Crystal Types Available and Their Frequency Range

Crystal Frequency	Motorola Type
290-800 kc	AQL
1250-1600 kc	ANL and AN
2000-6000 kc	ANL and AN
6000-10000 kc	AUL
10000-13000 kc	ANL and AN

To align the i-f section of a receiver:

(a) Plug the applicable i-f test crystal into the "A" terminals on the crystal socket inside the test set.

(b) Plug the metering cable into the 20-pin socket on the test set.

(c) Plug the other end of the metering cable into the 11-pin plug on the receiver chassis.

(d) Connect one end of the r-f probe extension cable to the r-f connector on the test set. Connect the other end of the r-f probe extension cable to the r-f probe cable. Place the r-f probe under the receiver chassis near the grid of the last mixer tube.

(e) Place the Function Selector Switch in the RCVR position.

(f) Place the Position Selector Switch in position 1.

(g) Align the receiver as described in the instructions supplied with the receiver. Note that the test set Position Selector Switch positions may differ from those in the receiver instructions. Refer to the chart in paragraph 4a. of these instructions for a cross reference between switch positions.

(2) 450-470 mc and 890-960 mc Receivers - Multiplier Grid Current Measurements

(a) Connect the metering plug to the test set and to the receiver.

(b) Place the Function Selector Switch in the RCVR position.

(c) Place the Position Selector Switch in position #7 or #8.

(d) Hold the Multiplier switch in the MULT position.

Complete, detailed alignment procedures are described in the instructions supplied with the receivers.

NOTE

In some early models of the 450-470 mc receivers, the first oscillator multiplier is wired to pin #7 and the second oscillator multiplier is wired to pin #8 of the 11-pin metering socket on the receiver chassis. In later models of the 450-470 mc and the 890-960 mc receivers the first multiplier is wired to pin #6 and the second multiplier is wired to pin #7 of the 11-pin metering socket on the receiver chassis. In the latter case, the MULT switch is used only to measure the second multiplier.

CAUTION

DO NOT use the MULT position when testing receivers which do not have oscillator multipliers, e.g., 25-54 mc, 72-76 mc and 132-174 mc receivers. The 50 ua meter movement can tolerate a 10 times overload which results in 0.5 ma and approximately one volt across the meter. However, with silicon diodes shunting the meter movement, the current required to maintain one volt across the circuit must exceed 10 ma. In the most sensitive meter connection, approximately 200 volts will cause 10 ma to flow in the circuit. The power dissipated by the resistor is approximately two watts. Since the resistor is rated at 1/2 watt, the duration of this type of overload should be limited, to prevent damage to the precision resistor.

b. Receivers Incorporating a Phone-Jack Metering Connector

To measure receivers which have a phone-jack metering connector, the accessory cable (with a phone-plug at each end) must be used. When the phone-plug is connected to the test set METER receptacle, the Function Selector Switch, Position Selector Switch, XMTR ON button, MICROPHONE connector and the Multiplier Switch are removed from the circuitry. The only exception is the zero center, since it is a separate circuit as described in paragraph 7b.

With the phone-plug connected, the 0-50 ua meter movement is the only scale which can be used. The polarity of the meter may be changed by the METER REV switch.

(1) Plug the red phone-plug, on the accessory cable, into the METER socket on the test set.

(2) Plug the black phone-plug on the other end of the accessory cable into the phone-jack meter connector on the receiver to be tested.

(3) Refer to the instructions supplied with the receiver for detailed metering procedures.

6. TRANSMITTER METERING PROCEDURES

Most Motorola FM communications transmitters incorporate either an 11-pin metering plug or a phone-jack mounted on the transmitter chassis. Transmitters which do not have the metering plug or phone-jack have no special facilities for metering purposes. When measuring the latter type of transmitters, refer to the transmitter alignment chart supplied with the transmitter.

a. Transmitters Incorporating an 11-pin Metering Plug

The Metering Chart, EPD-7603, included with this instruction manual, lists all of the stages which can be measured in a transmitter incorporating an 11-pin metering socket. As an example, with the Position Selector Switch in position 2, the procedure is as follows:

The circuit to be metered is the oscillator or tripler in all Motorola transmitters except 25-54 mc and some 132-174 mc transmitters. When the metering cable is plugged into the socket on the front panel, the meter is connected across pins #2 and #11 on the 20-pin plug and pins #2 and #11 on the 11-pin plug of the metering cable. At the same time a resistance of 18,000 ohms, in the test set, is placed in series with the meter. The scale to read is the 0-50 ua scale.

(1) Measurement of Power Amplifier (PA) Plate Current

Measure the PA current as follows:

(a) Connect the metering plug to the test set and to the transmitter.

(b) Place the Function Selector Switch in the XMTR position.

(c) Place the Position Selector Switch in position #7, PA.

(d) Push the XMTR ON switch and hold it down during the testing period.

The scale to read is the 0-50 ua scale. Refer to the instructions supplied with the transmitter to interpolate the microampere reading to milliamperes plate current.

NOTE

For PA readings, the transmitter must by keyed by the XMTR ON button. A PA reading cannot be obtained by keying the transmitter with a microphone push-to-talk switch.

b. Transmitters Incorporating a Phone-Jack Metering Connector

To measure transmitters which have a phone-jack metering connector, the accessory cable (with a phone-plug at each end) must be used. When the phone-plug is connected to the test set METER receptacle, the Function Selector Switch, Position Selector Switch, XMTR ON button, MICROPHONE connector and the Multiplier Switch are removed from the circuitry. The only exception is the zero center, since it is a separate circuit as described in paragraph 7b.

With the phone-plug connected, the 0-50 ua meter movement is the only scale which can be used. The polarity of the meter may be changed by the METER REV switch.

(1) Plug the red phone-plug, on the accessory cable, into the METER socket on the test set.

(2) Plug the black phone-plug on the other end of the accessory cable into the phone-jack meter connector on the transmitter to be tested.

(3) Refer to the instructions supplied with the transmitter for detailed metering procedures.

c. Measurement of Transmitter RF Power Output

The P-7208 and P-7208A RF Dummy Loads are available on separate purchase order for use with the test set to measure transmitter r-f power output. The P-7208 has a standing wave ratio of less than 1.2 between 25 mc and 174 mc with a 50 ohm load impedance. The power capabilities of both dummy loads is 25 watts for continuous operation and 60 watts for intermittent operation. The P-7208A is used with Motorola "Handie-Talkie"® FM Radiophone and Pack Sets. It has the same rated capacity as the P-7208 and is calibrated for a full scale reading of 50 ua with 2 watts r-f power.

Measure the r-f power output as follows:

(1) Plug the red phone-plug, on the accessory cable, into the METER socket on the test set.

(2) Plug the black phone-plug, on the accessory cable, into the dummy load.

(3) Connect the transmitter ANT connector to the coaxial connector on the dummy load. Use the r-f extension cable supplied with the test set.

(4) Turn on the transmitter by means of the microphone used with the radio set.

(5) Note the reading on the meter. Refer to the calibration curve supplied with the dummy load to convert the microamperes to watts.

7. MAINTENANCE

a. Service Accessibility

Turn the panel fasteners (one located above the Function Selector Switch and the other is above the Position Selector Switch) one-half turn and pull down for access to the four batteries. Remove the protective cover to expose the circuitry. Refer to the parts location detail for location of the various components of the circuit.

b. Zero Center Adjustment

The zero center scale (top scale) is adjusted at the factory for an exact zero meter reading. Due to aging and battery life, it may be necessary to readjust the zero center. This control is located on the left inside of the test set through a hole in the protective cover. Refer to the parts location detail. Adjust the control as follows:

(1) Place the Function Selector Switch in the RCVR position.

(2) Place the Position Selector Switch in position 4.

(3) Turn the control in the direction which moves the needle toward zero center. When the needle reaches the zero point, the adjustment is completed.

If the adjustment control does not bring the meter to zero center, replace the 1-1/2 volt battery in the zero center circuit.

c. AC Voltmeter Calibration

The voltmeter is calibrated at the factory. If any components in the meter circuitry are replaced, it may be necessary to recalibrate the meter. The meter calibration control is located on the printed circuit board. Refer to the parts location detail for location of the control.

(1) Plug the 20-pin metering plug into the test set, to jumper pin #19 and #20.

(2) Place the Function Selector Switch in the XMTR position.

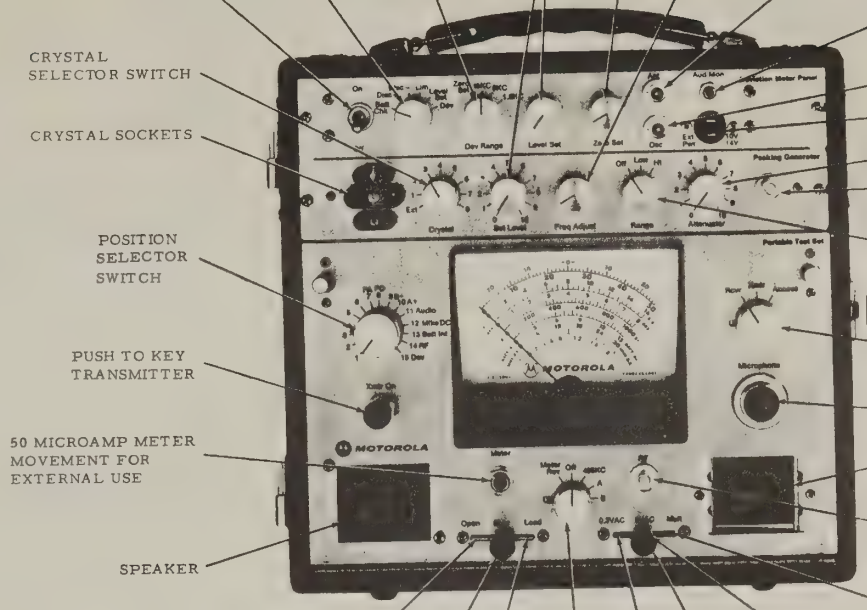
(3) Connect an a-c power source to pins #1 and #2 of the MICROPHONE receptacle on the front panel.

(4) Adjust the power source for 2 volts output measured with a voltmeter of known accuracy.

(5) Adjust the meter calibration control until the meter (bottom scale) indicates 2 volts full scale.

POSITION	CIRCUIT MEASURED
1-6	REFER TO APPLICABLE INSTRUCTION MANUAL FOR STAGES BEING MEASURED.
7	POWER AMPLIFIER PLATE CURRENT IN TRANSMITTERS. (SEE APPLICABLE INSTRUCTION MANUAL FOR INTERPOLATION TO MILLIAMPERES) OSCILLATOR MULTIPLIER GRID IN 450-470 MC & 890-960 MC RECEIVERS. (SEE TEXT)
8	RELATIVE POWER OUTPUT OF 450-470 MC & 890-960 MC TRANSMITTERS. ALSO OSCILLATOR MULTIPLIER IN SOME 450-470 MC RECEIVERS. (SEE TEXT)
9	B+ IN TRANSMITTERS AND RECEIVERS WHEN SUCH VOLTAGE IS WIRED TO METERING SOCKET
10	A+ IN DC RECEIVERS RELAY VOLTAGE IN AC TRANSMITTERS.
11	AUDIO OUTPUT OF RECEIVERS. AUDIO INPUT OF TRANSMITTERS.
12	MIC DC IN TRANSMITTERS
13	6 VOLT BATTERY INSIDE TEST SET
14	RELATIVE RF OUTPUT OF I.F. OSCILLATOR OR RF FIELD STRENGTH INPUT.

FCEPS-16233-O


DEVIATION RANGE SWITCH
ZERO SET - FOR ZERO ADJUST OF METER
FUNCTION SWITCH
LEVEL CONTROLS
FREQ. ADJUST CONTROL
ANTENNA CONNECTOR
ON-OFF SWITCH
AUD. MON. - CONNECT EARPHONES OR OSCILLOSCOPE
CRYSTAL SELECTOR SWITCH
OSCILLATOR CONNECTOR
EXTERNAL POWER CONNECTOR
CRYSTAL SOCKETS
ATTENUATOR CONTROL
RF CONNECTOR
RANGE SWITCH
OFF - BATTERY CIRCUIT OPEN
LO - CRYSTAL FROM 4 TO 8 MC
HI - CRYSTAL FROM 9 TO 9.6 MC
POSITION SELECTOR SWITCH
FUNCTION SELECTOR SWITCH
RCVR - TO METER RECEIVERS
XMTR - TO METER TRANSMITTERS
ACCESS - TO METER ACCESSORIES
PUSH TO KEY TRANSMITTER
MICROPHONE SOCKET
50 MICROAMP METER MOVEMENT FOR EXTERNAL USE
METERING CABLE SOCKET
RF OUTPUT OF IF OSCILLATOR OR RF FIELD STRENGTH INPUT
SPEAKER
TO MEASURE OSCILLATOR MULTIPLIERS IN POSITION 7 OR 8
30 OHM LOAD ACROSS RECEIVER OUTPUT
3 OHM LOAD ACROSS RECEIVER OUTPUT
0.2 VOLT AC VOLTAGE RANGE FOR AUDIO (11) MEASUREMENT
2 VOLT AC VOLTAGE RANGE FOR AUDIO (11) MEASUREMENT
SPEAKER NORMAL
OSCILLATOR & METER REVERSING SWITCH
MULTIPLIER SWITCH

METERING CHART

S1056A/B, S1057A/B, S1058A/B AND S1059A/B PORTABLE TEST SET

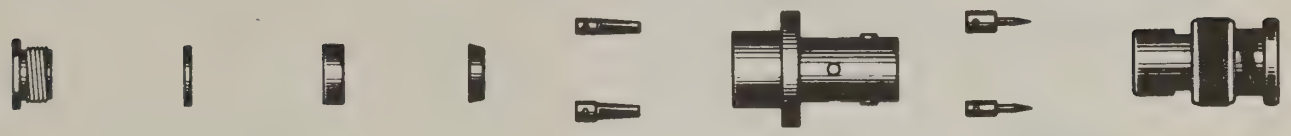
(TO BE USED WITH THE ALIGNMENT PROCEDURES DESCRIBED IN THE INSTRUCTIONS SUPPLIED WITH EACH RECEIVER AND TRANSMITTER)

	FUNCTION SELECTOR SWITCH **RCVR.** POSITION (SEE NOTE 3)		FUNCTION SELECTOR SWITCH **XMTR.** POSITION (SEE NOTE 4)		FUNCTION SELECTOR SWITCH **ACCESS.** POSITION
POSITION OF POSITION SELECTOR SWITCH	CIRCUIT METERED IN MOTOROLA RECEIVERS	METER SCALE	CIRCUIT MEASURED IN MOTOROLA TRANSMITTERS	USE METER SCALE	IN THIS POSITION THE TEST SET METER IS SWITCHED TO PROVIDE METERING FOR THE PEAKING GENERATOR ACCESSORY
1	See Alignment Chart	0-50 ua	Same as Position 8	0-50 ua	
2	See Alignment Chart	0-50 ua	Osc. or Tripler Except in 25-54 Mc and Some 144-174 Mc	0-50 ua	
3	See Alignment Chart	0-50 ua	Doubler Except Not Used in some 25-54 Mc Xmtrs.	0-50 ua	
4	Discriminator Output	20-0-20 ua	Doubler or Tripler	0-50 ua	
5	Discriminator Input	0-50 ua	Doubler or Tripler	0-50 ua	
6	See Alignment Chart	0-50 ua	Grid of Power Amplifier	0-50 ua	
7	Multipliers in 450-470 Mc and 890-960 Mc Rcvrs. with Multiplier Switch in **Mult.** Position	0-50 ua	Power Amplifier Plate Current } See Note 2	See Alignment Chart	
8		0-50 ua	Relative Power Output of 450-470 Mc & 890-960 Mc Units	Relative 0-50 ua	
9	B+ (when wired)	0-1000 V	B+ to Power Amplifier Stages	0-1000 V	
10	Filament Voltage when wired (DC Only)	0-15 VDC	Push-to-Talk Voltage with Xmtr. Unkeyed	0-15 VDC	
11	Audio Output of Receiver	See Note 1 0-2 VAC 0-.2 VAC	Audio Input To Transmitter	See Note 1 0-2 VAC 0-.2 VAC	
12	NONE		Microphone DC Voltage	0-30 VDC	
13	Test Set Battery Check	0-15 V	Test Set Battery Check	0-15 VDC	
14	RF Output of IF Oscillator or Field Strength	Relative 0-50	RF Output of IF Oscillator or Field Strength	Relative 0-50	
15	Deviation Meter	0-16 Kc 0-8 Kc 0-1.6 Kc	Deviation Meter	0-16 Kc 0-8 Kc 0-1.6 Kc	

NOTES:

1. The **MULT** switch changes the range from 2 VAC full scale to .2 VAC full scale. ±10% −5°C to +60°C (−30% at −30°C).
2. To obtain PA current reading, the transmitter must be keyed by the **XMTR ON** switch. The Microphone push-to-talk switch can be used for all other transmitter metering.
3. When measuring receivers, the function selector switch must be in the **RCVR** position and the metering cable connected to the test set and receiver.
4. When measuring transmitters, the function selection switch must be in the **XMTR** position and the metering cable connected to the test set and transmitter.
5. The deviation meter is not wired through the metering cable. It must be turned on and off with the switch on its own front panel.

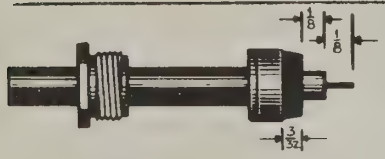
TYPE BNC
CONNECTOR ASSEMBLY INSTRUCTIONS



Trim jacket ¼" for RG-58/U, 5/16" for RG-59/U or 7/16" for RG-71/U.

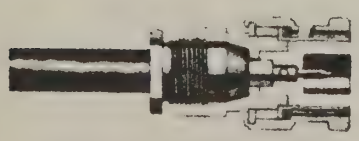
Fray shield and strip inner dielectric ⅛". Tin center conductor.

Taper braid and slide nut, washer, gasket and clamp over braid. Clamp is inserted so that its inner shoulder fits squarely against end of cable jacket.



With clamp in place, comb out braid, fold back smooth as shown and trim 3/32" from end.

Slip contact in place, butt against dielectric and solder. Remove excess solder from outside of contact. Be sure cable dielectric is not heated excessively and swollen so as to prevent dielectric from entering into connector body.



Push assembly into body as far as it will go. Slide nut into body and screw in place with wrench until tight. For this operation, hold cable and shell rigid and rotate nut.

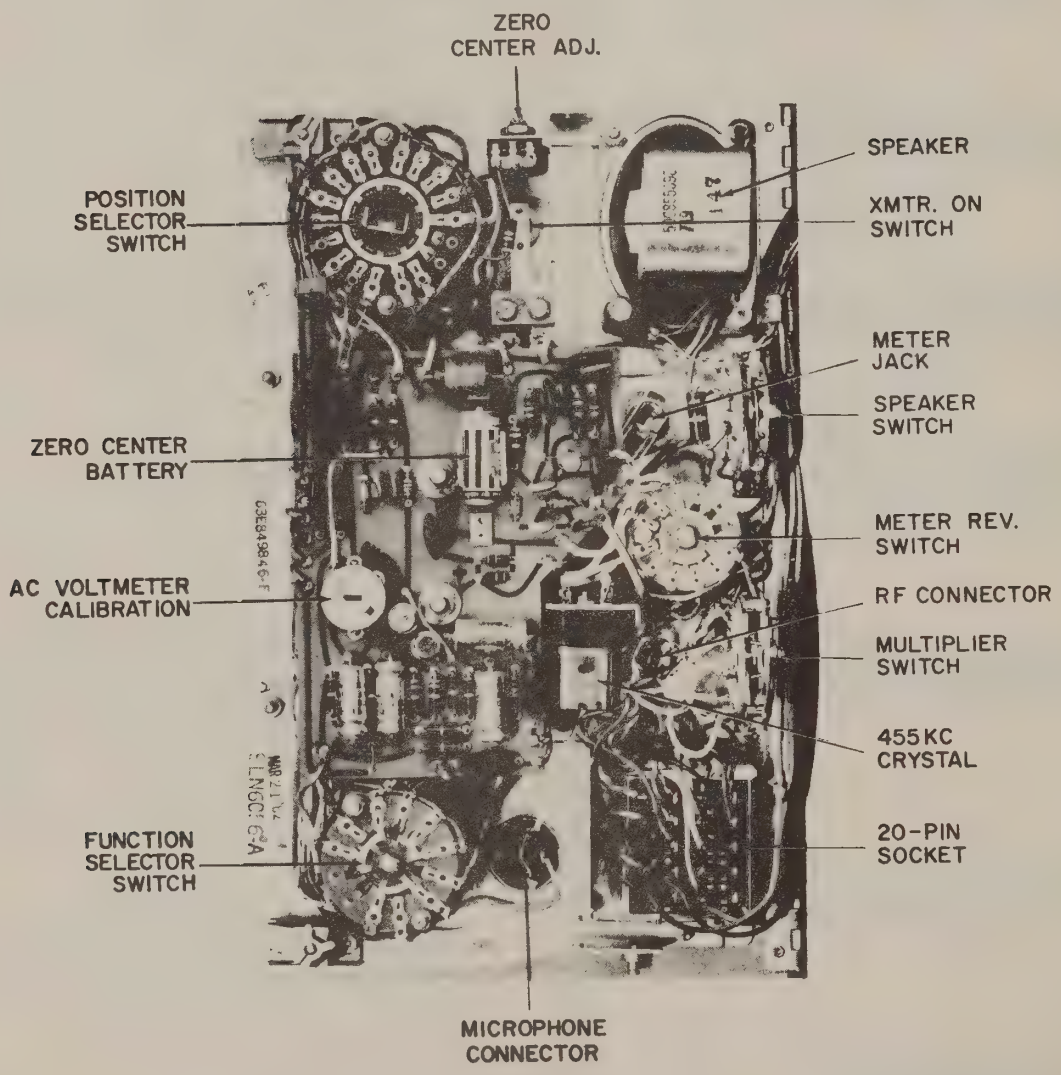
RF PROBE EXTENSION CABLE

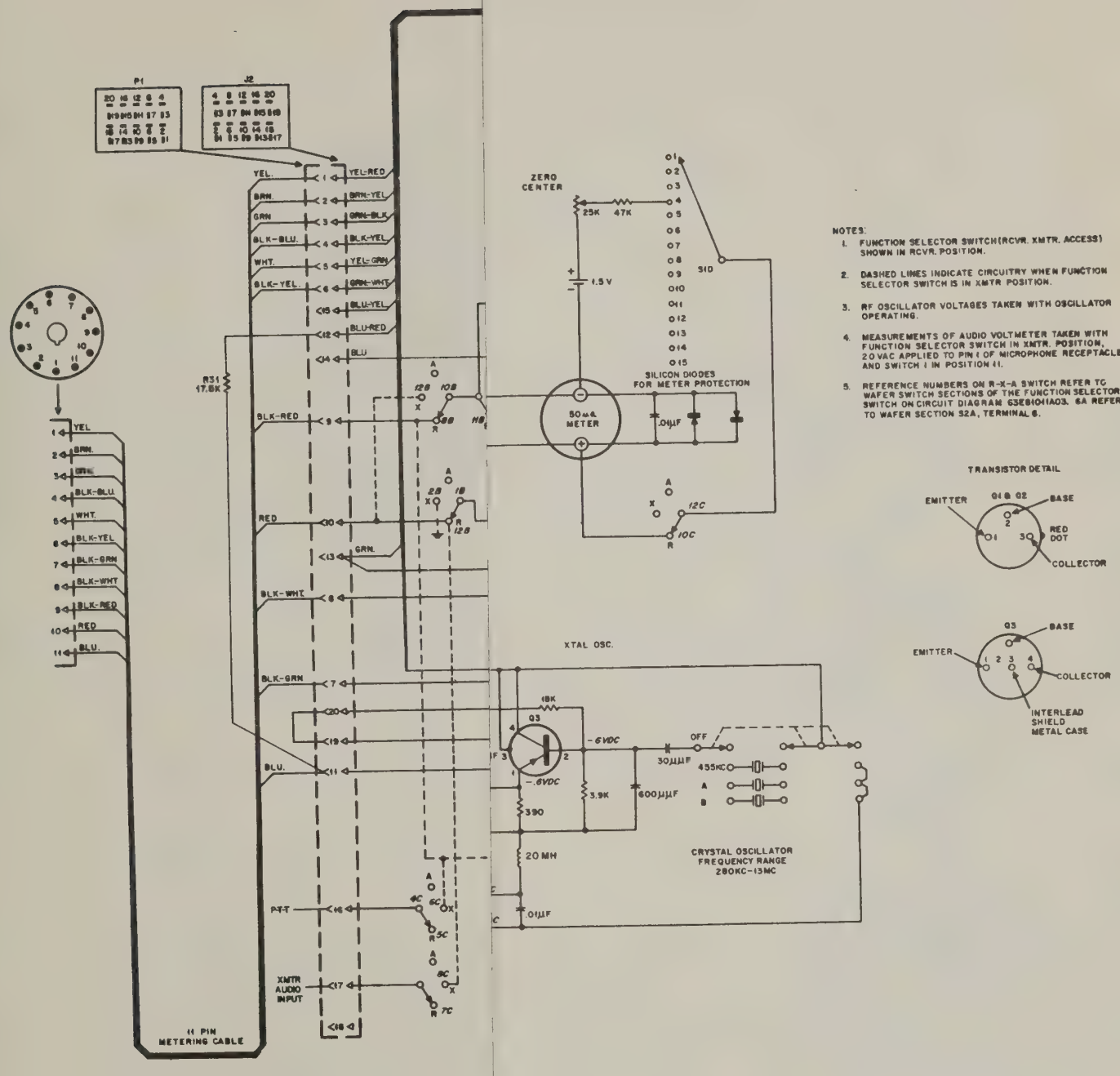
RF PROBE CABLE

ACCESSORY CABLE

ADAPTER FOR RF PROBE EXTENSION CABLE

REAR VIEW OF FRONT PANEL





NOTES:

1. FUNCTION SELECTOR SWITCH(RCVR. XMTR. ACCESS) SHOWN IN RCVR. POSITION.
2. DASHED LINES INDICATE CIRCUITRY WHEN FUNCTION SELECTOR SWITCH IS IN XMTR POSITION.
3. RF OSCILLATOR VOLTAGES TAKEN WITH OSCILLATOR OPERATING.
4. MEASUREMENTS OF AUDIO VOLTMETER TAKEN WITH FUNCTION SELECTOR SWITCH IN XMTR. POSITION, 20 VAC APPLIED TO PIN 1 OF MICROPHONE RECEPTACLE AND SWITCH 1 IN POSITION 11.
5. REFERENCE NUMBERS ON R-X-A SWITCH REFER TO WAFER SWITCH SECTIONS OF THE FUNCTION SELECTOR SWITCH ON CIRCUIT DIAGRAM 63E81041A03. 6A REFERS TO WAFER SECTION 2A, TERMINAL 6.

Portable Test Set
Simplified Circuit Diagram
Motorola No. EEPD-7579-D

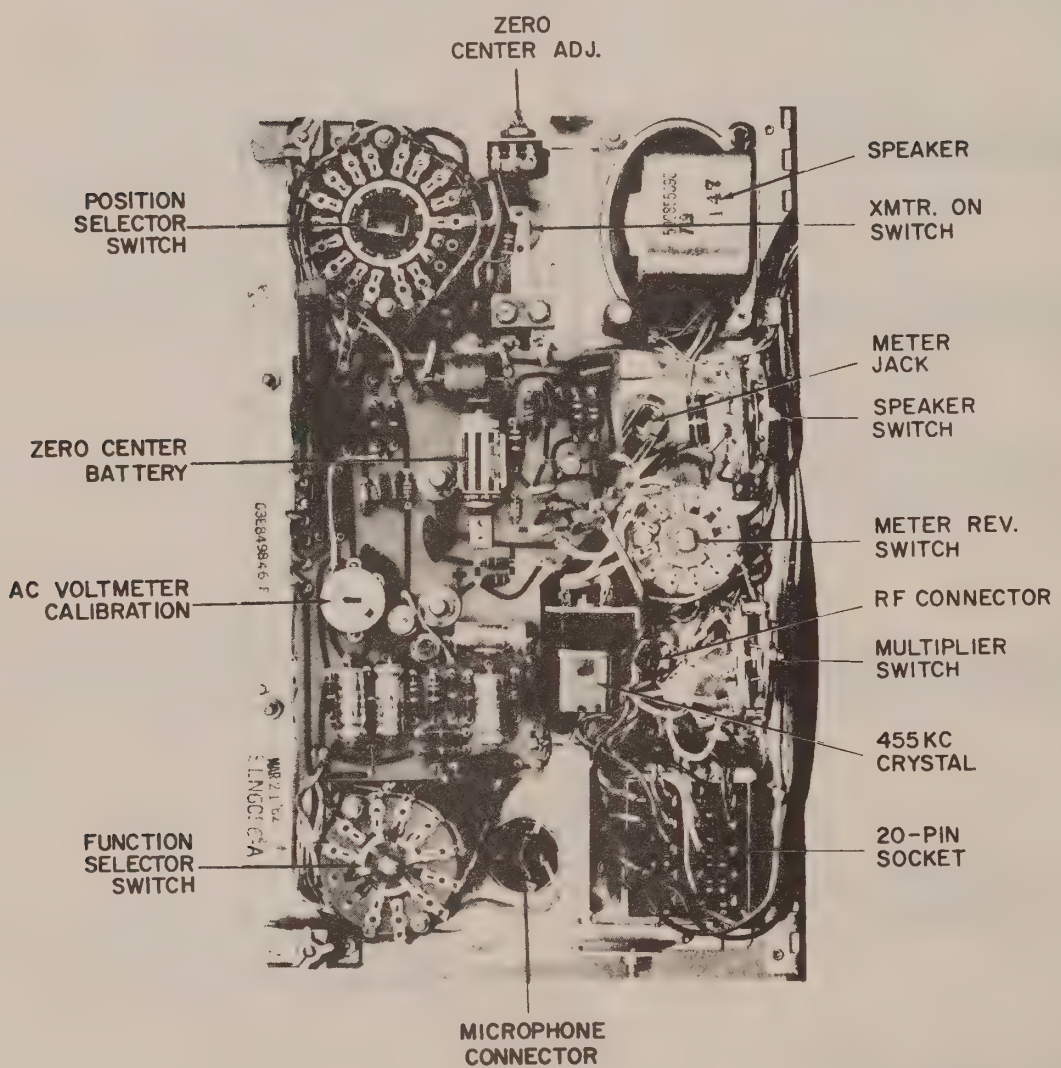
RF PROBE EXTENSION CABLE

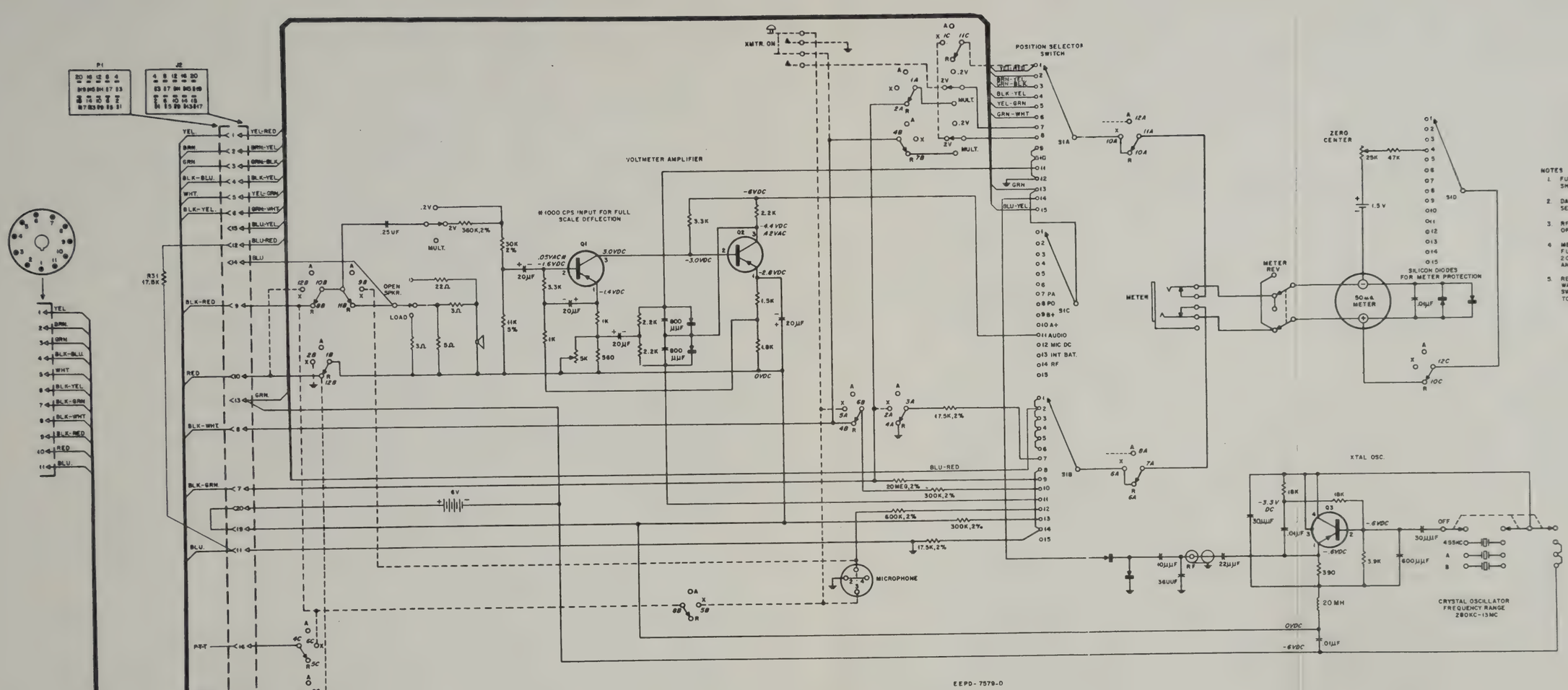
RF PROBE CABLE

ACCESSORY CABLE

ADAPTER FOR RF PROBE EXTENSION CABLE

REAR VIEW OF FRONT PANEL



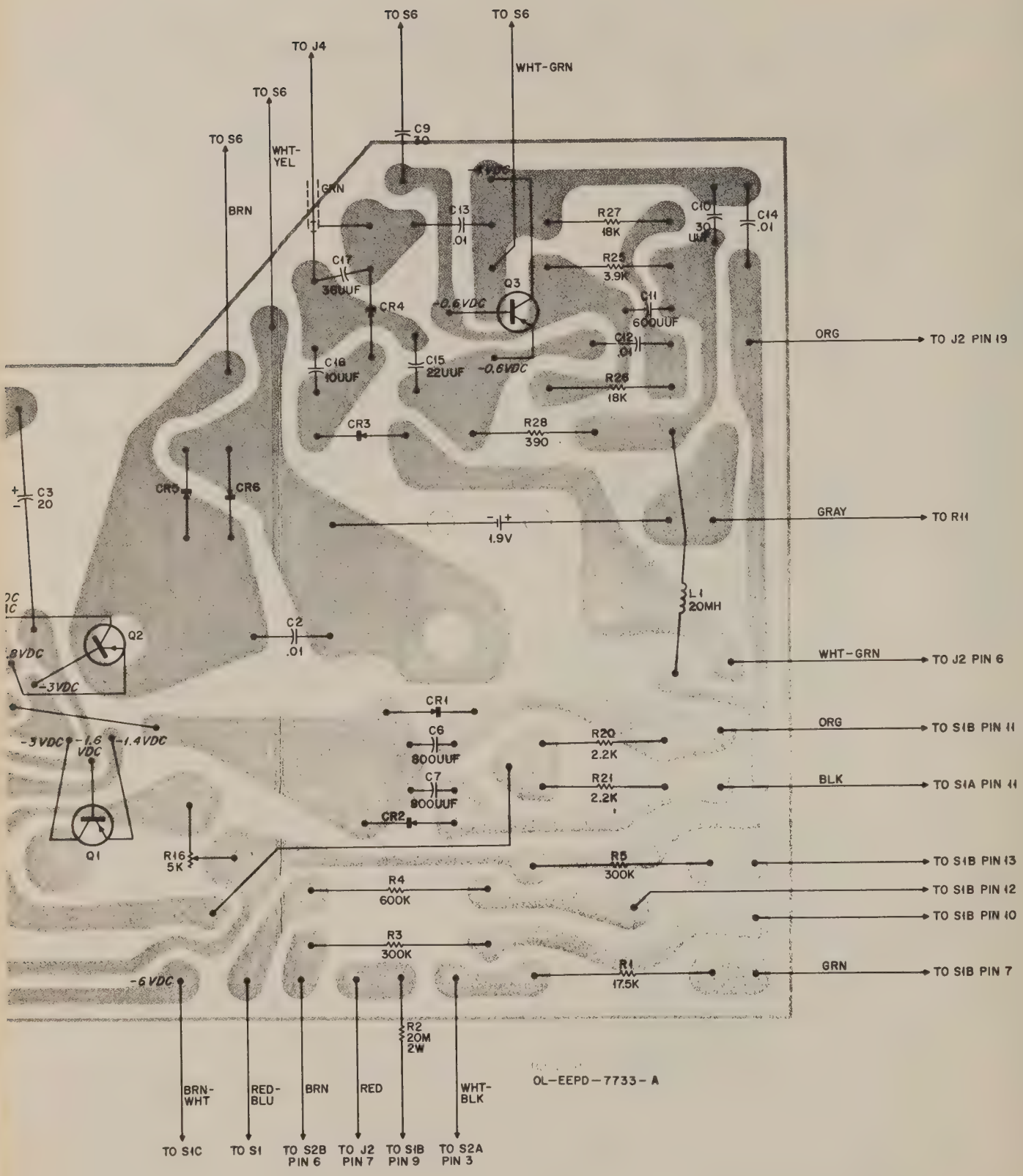


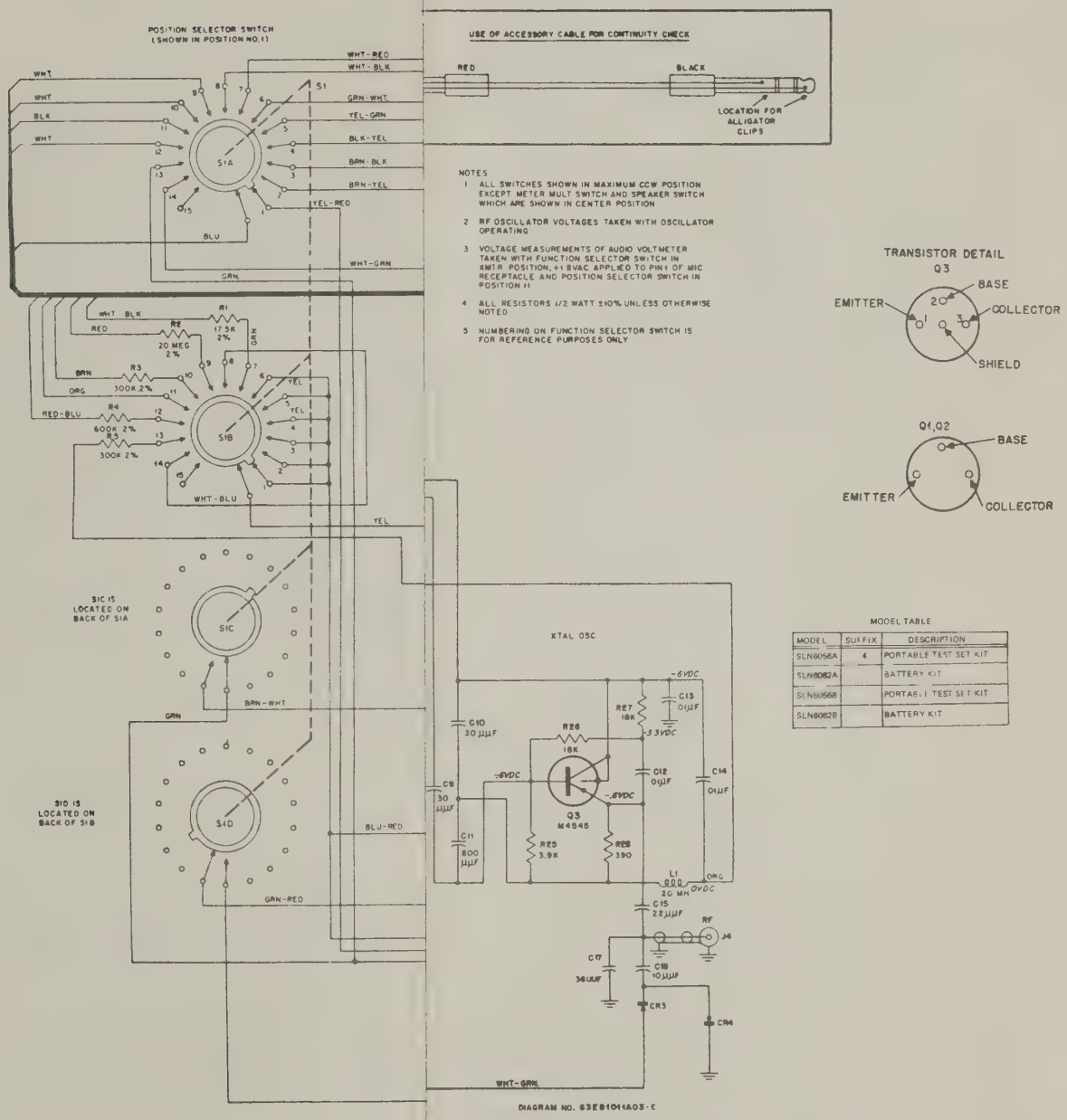
EEPD-7579-D

NOTES

1. FUNCTION SELECTOR SWITCH(RCVR XMTR. ACCESS) SHOWN IN RCVR. POSITION.
2. DASHED LINES INDICATE CIRCUITRY WHEN FUNCTION SELECTOR SWITCH IS IN XMTR POSITION.
3. RF OSCILLATOR VOLTAGES TAKEN WITH OSCILLATOR OPERATING.
4. MEASUREMENTS OF AUDIO VOLTMETER TAKEN WITH FUNCTION SELECTOR SWITCH IN XMTR. POSITION, 2.0 VAC APPLIED TO PIN 1 OF MICROPHONE RECEPTACLE AND SWITCH 1 IN POSITION 11.
5. REFERENCE NUMBERS ON R-X-A SWITCH REFER TO WAFER SWITCH SECTIONS OF THE FUNCTION SELECTOR SWITCH ON CIRCUIT DIAGRAM 63E804IAG3. 6A REFERS TO WAFER SECTION S2A, TERMINAL 6.

Portable Test Set
Simplified Circuit Diagram
Motorola No. EEPD-7579-D


TO S6
TO S6
TO J4
WHT-GRN
TO S6
C9
30
TO S6
WHT-YEL
GRN
BRN
-1VDC
C13
.01
R27
18K
C10
30
UUF
C14
.01
R25
3.9K
C17
36UUF
Q3
CR4
-0.6VDC
C11
600UUF
ORG
TO J2 PIN 19
C12
.01
C16
10UUF
C15
22UUF
-0.6VDC
R26
18K
CR3
R28
390
C3
20
CR5
CR6
GRAY
TO R11
1.9V
L1
20MH
Q2
C2
.01
WHT-GRN
TO J2 PIN 6
-3VDC
CR1
-3VDC
-1.6 VDC
-1.4VDC
C6
800UUF
R20
2.2K
ORG
TO S1B PIN 11
C7
800UUF
R21
2.2K
BLK
TO S1A PIN 11
CR2
Q1
R16
5K
R5
300K
TO S1B PIN 13
R4
600K
TO S1B PIN 12
TO S1B PIN 10
R3
300K
R1
17.5K
GRN
TO S1B PIN 7
-6VDC
R2
20M
2W
BRN-WHT
RED-BLU
BRN
RED
WHT-BLK
TO S1C
TO S1
TO S2B PIN 6
TO J2 PIN 7
TO S1B PIN 9
TO S2A PIN 3
OL-EEPD-7733-A

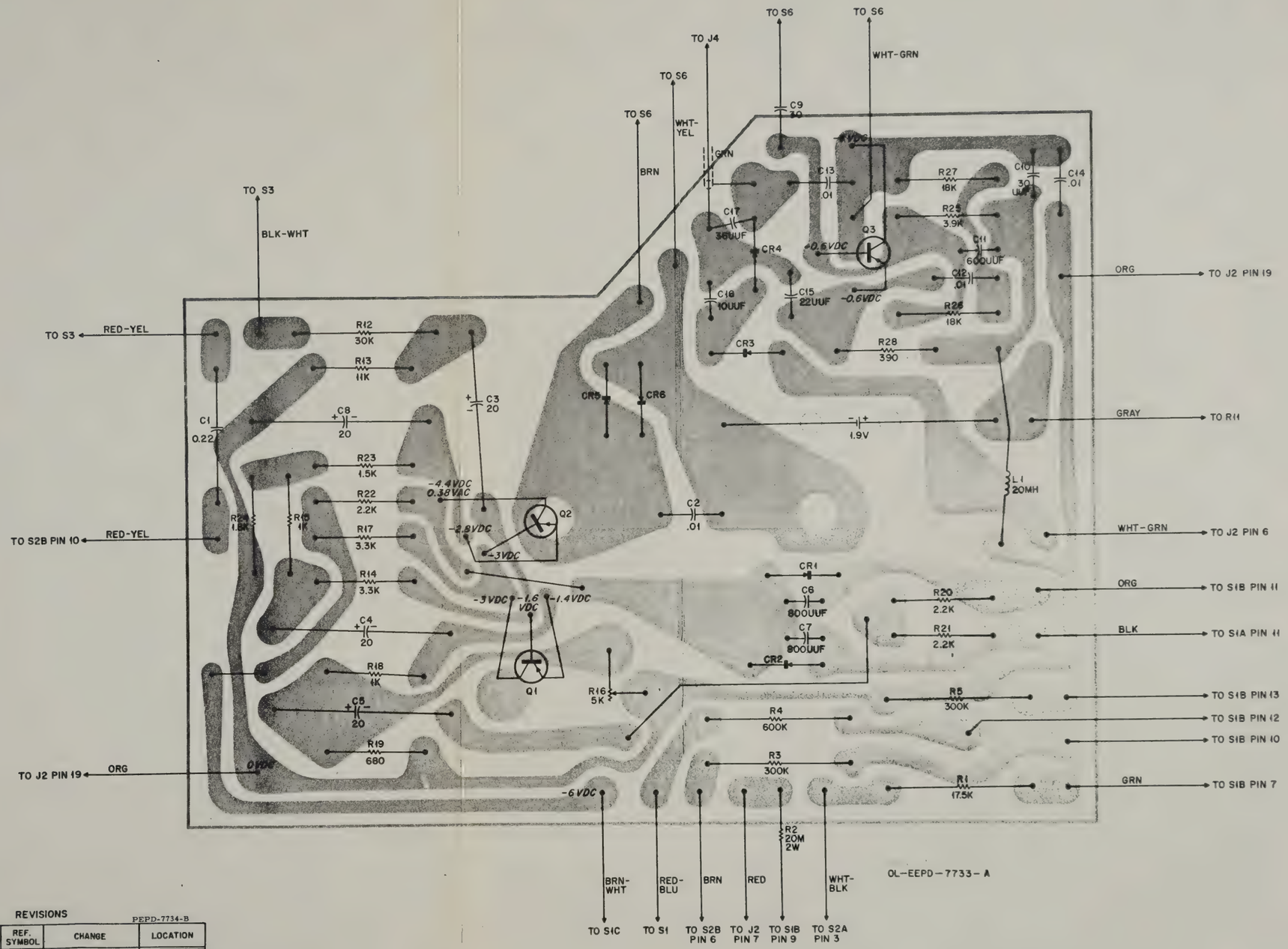


MODEL TABLE

MODEL	SUFFIX	DESCRIPTION
SLN6056A	4	PORTABLE TEST SET KIT
SLN8082A		BATTERY KIT
SLN6056B		PORTABLE TEST SET KIT
SLN8082B		BATTERY KIT

PREVIOUS REVISIONS AND PARTS LIST
SHOWN ON BACK OF THIS DIAGRAM

Portable Test Set
Schematic Diagram
Motorola No. 63E81011A03-E

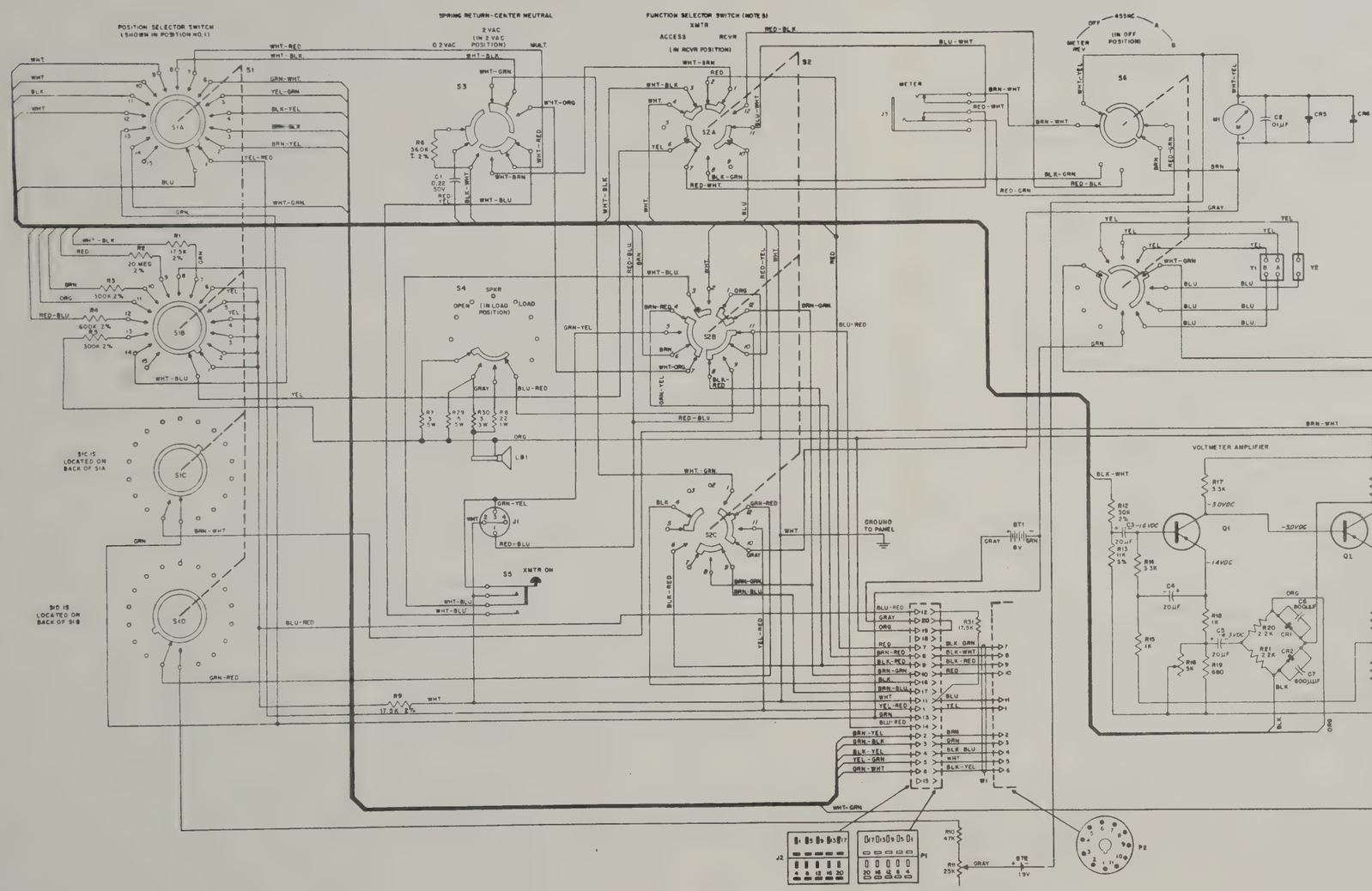


REVISIONS

PEPD-7734-B

BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
SLN6056A-2	C1	WAS 8K834384	UPPER LEFT OF BOARD
SLN6056B		MODEL ADDED	

Portable Test Set
Printed Board and Wiring Diagram
Motorola No. EPD-7734-B


POSITION SELECTOR SWITCH (SHOWN IN POSITION NO. 1)
SPRING RETURN-CENTER NEUTRAL
FUNCTION SELECTOR SWITCH (NOTE 5)
XMTR
ACCESS
RCVR
(IN RCVR POSITION)
2 VAC
(IN 2 VAC POSITION)
0.2 VAC
WAIT
S1
S1A
S1B
S1C
S1D
S2
S2A
S2B
S2C
S3
S4
SPKR
OPEN
LOAD
(IN LOAD POSITION)
S5
XMTR ON
S6
OFF
455 KC
(IN OFF POSITION)
METER REV
METER
J1
J2
J3
P1
P2
W1
LS1
R1 17.5K 2%
R2 20 MEG 2%
R3 100K 2%
R4 600K 2%
R5 300K 2%
R6 360K 1%
R7 3 2W
R8 22 1W
R9 17.5K 2%
R29 5W
R30 3 3W
R31 17.5K
R32 47K
R33 25K
C1 0.22 50V
C2 0.1µF
CR5
CR6
WHT-RED
WHT-BLK
WHT-GRN
WHT-ORG
WHT-BRN
WHT-BLU
GRN-WHT
YEL-GRN
BLK-YEL
BRN-YEL
YEL-RED
BLU
GRN
WHT
BLK
BRN
ORG
RED
YEL
GRAY
BLU-RED
BRN-WHT
RED-WHT
BLK-GRN
RED-BLK
RED-GRN
GRN-YEL
GRN-RED
BRN-GRN
BRN-BLU
BLU-WHT
BLK-RED
RED-BLU
WHT-BLU
SHD IS LOCATED ON BACK OF S1B
SHD IS LOCATED ON BACK OF S1A
GROUND TO PANEL
BT1 8V
BT2 19V
VOLTMETER AMPLIFIER
-4VDC
-8.0VDC
-14VDC
-16VDC
-6.4VDC 56VAC
-2.8VDC
-6.3VDC
Q1
Q2
Q3
M4545
XTAL OSC.
-6VDC
-5VDC
-3.3VDC
R10 47K
R11 25K
R12 50K 2%
R13 11K 2%
R14 33K
R15 1K
R16 5K
R17 33K
R18 1K
R19 680
R20 2.2K
R21 2.2K
R22 2.2K
R23 4.5K
R24 18K
R25 3.9K
R26 18K
R27 18K
R28 390
C3 20µF 16VDC
C4 20µF
C5 20µF 3.3VDC
C6 800µF
C7 800µF
C8 20µF
C9 30µµF
C10 30µµF
C11 600µµF
C12 .01µF
C13 .01µF
C14 .01µF
C15 22µµF
C16 40µµF
C17 36µµF
CR1
CR2
CR3
CR4
L1 .22 UH
Y1
Y2
RF
WHT-GRN
BRN-WHT
BLK-WHT
BLU-WHT
RED-BLK
RED-GRN
BLK-GRN
RED-WHT
BLU-RED
GRN-YEL
GRN-RED
BRN-GRN
BRN-BLU
WHT-BLU
WHT-ORG
YEL-RED
YEL-GRN
BLK-YEL
BRN-RED
BLK-RED
BRN-BLK
BLK-GRN
BLU-WHT
GRN-WHT
BLK-RED
RED-BLU
WHT-BLU
BLK-BLU
BLK-RED
BLK-GRN
BLK-WHT
BLK-YEL
BRN-YEL
BRN-BLK
BRN-GRN
BRN-BLU
YEL-GRN
GRN-WHT
WHT-GRN
BRN-WHT
RED-BLU
RED-YEL
RED-GRN
BLU-RED
BLU-WHT

TS LIST for Schematic Diagram 63E81011A03-E

6A/B Portable Test Set

RENCE IBOL	MOTOROLA PART NO.	DESCRIPTION
		BATTERY, dry:
	60B855262	1-1/2 volt; "N" size cell
		CAPACITOR, fixed:
	8D82905G12	mylar .22 ±10%; 50 v ±20%; 200 v
13, 14	21B801139	ceramic; disc; .01 uf +80-20%; 600 v
5, 8	23C844927	Electrolytic; tubular; 20 uf
	or23C82601A03	+100-10%; 25 v
	21B847070	ceramic; disc; 800 uuf ±10%; 600 v
	21R114166	ceramic; disc; 30 uuf ±10%; 500 v
	21K851299	ceramic; disc; 600 uuf ±10%; 600 v
	21R124554	ceramic; disc; 22 uuf ±5%; 500 v
	21R410063	ceramic; disc; 10 uuf ±5%; 500 v
	21K852185	ceramic; disc; 36 uuf ±5%; 500 v
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
, 3, 4	48-82139G01	germanium
	48-82392B03	silicon
		CONNECTOR, receptacle:
	9B16345	female; 4 cont; polarized round molded phenolic insulator chassis mounted
	28B855267	male; 20 cont; polarized; rect. molded black phenolic insulator; saddle mounted
		JACK, telephone:
	9B855279	contact arrangement of stacks, 2 form "B"
		CONNECTOR, receptacle:
	9B855268	female; single cont.; round molded insulator 50 ohm imped. chassis mounted
		COIL, RF:
	24B801876	choke; 20 mh; coded BLUE dot
		SPEAKER, magnetic:
	50C855098	voice coil imped. 3.2 ohm; 3 w PM type; 2" x 3"
		METER, multi-scale:
	72D82534D01	panel mounted; c/o 20-0-20, 0-50 ua; 0-1000 v dc; 0-15 v dc; 0-30 v dc; 0-2 v ac
		CONNECTOR, plug:
	9B855266	female; 20 cont; polarized; rect. molded black phenolic insul; cable mounted
	28B813576	male; 11 cont; polarized; round molded black phenolic insulator; does not incl; 1V858293 SHELL, con. & handle & 41A483715, SPRING, con shell ret; shell & spring must be ordered separately
		TRANSISTOR: (SEE NOTE)
	48-869571	PNP; type M9571
	48R134545	PNP; type M4545
		RESISTOR, fixed: carbon; unl stated
	6K855337	17.5K ±2%; 1/2 w
	6K892455	20 megohm ±2%; 2 w
	6K855329	300K ±2%; 1/2 w
	6K855330	600K ±2%; 1/2 w
	6K855332	360K ±2%; 1/2 w
	17K82839	wire-wound; 3 ohm; ±10%; 5 w
	6R488026	22 ohm ±10%; 1 w
	6R6048	47K ±10%; 1/2 w
	18K848202	var; 25K ±20%; .2 w
	6K855331	30K ±2%; 1/2 w
	6R115017	11K ±5%; 1/2 w
7	6R5581	3.3K ±10%; 1/2 w
3	6R6229	1K ±10%; 1/2 w
	18C855263	var; wire-wound; 5K ±20%; 1 w

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
R19	6R6040	680 ohm ±10%; 1/2 w
R20, 21, 22	6R6069	2.2K ±10%; 1/2 w
R23	6R6038	1.5K ±10%; 1/2 w
R24	6R2089	1.8K ±10%; 1/2 w
R25	6R5659	3.9K ±10%; 1/2 w
R26, 27	6R5591	18K ±10%; 1/2 w
R28	6R5554	390 ohm ±10%; 1/2 w
R29	17K852457	wire-wound; 5 ohm ±10%; 5 w
R30	17K863951	wire-wound; 3 ohm ±10%; 3 w
R31	6K855337	17.5K ±5%; 1/2 w
		SWITCH, rotary:
S1	40C855097	2 sect; cont; non-shorting
S2	40B855095	3 sect; 3 posi; non-shorting
S6	40B855093	2 sect; 5 posi; non-shorting
		SWITCH, lever:
S3	40B855094	1 sect; 3 posi; non-shorting
S4	40B855096	1 sect; 3 posi; shorting
		SWITCH, push:
S5	40C848230	cont; 2 form "A"; non-locking
		CABLE ASSEMBLY, special purpose
W1	1V858292	incl; 30B474498 CABLE, 12 cond; rubber covered; 50" length req'd; 10M519 WIRE, elec; single cond #24 ga. sol.; 1" req'd Ref parts P1, P2)
		CRYSTAL UNIT, quartz:
Y1		Not supp; when odering refer to Table 2, pg. 5 for freq. & type
Y2	Type AQL	455 kc
		SOCKET, crystal;
XY1	9K857508	female; 4 cont; sq. molded black bakelite base; chassis mounted
XY2	9K857509	female; 2 cont; rect. molded black bakelite base; chassis mounted
	NON-REFERENCED ITEMS	
	13A855076	GRILLE, speaker
	36A855276	BUTTON, lever, 2 req'd; for ref. parts S3, S4
	36A855070	KNOB, control: 2 req'd; for ref parts S1, S2
	36A855071	KNOB, control; for ref. part S6
	55A855264	FASTENER, adjustable pawl R.H.
	55K855265	FASTENER, adjustable pawl L.H.
	58B855270	ADAPTER: UHF to BNC
	1V855413	ACCESSORY CABLE ASSEMBLY: Incl: 30A76858 CABLE, special purpose; 2 cond; rubber covered; 4 ft. length req'd; 28A855277 PLUG, telephone black handle 28K855278 PLUG, telephone red handle
	1V855414	RF TEST LEAD ASSEMBLY: incl; 30B475378 CABLE, RF: coaxial RG-58A/U; 4 ft length req'd; 28B844876 CONNECTOR, plug: single cont. 2 req'd
	1V855415	RF PROBE ASSEMBLY; incl; 30B475378 CABLE, RF; coaxial RG-58A/U; 1 ft. length req'd; 9B855269 JACK, telephone
	1V855404	METER PANEL ASSY. (Riveted)
	1V855411	METER PANEL COVER ASSY.: (Riveted)
	1V867350	CASE ASSY.: Incl. 16E855419 CASE, test set; 42B861758 HOLDER, battery; 7A82479 BRACKET

SLN6082A/B Battery Kit

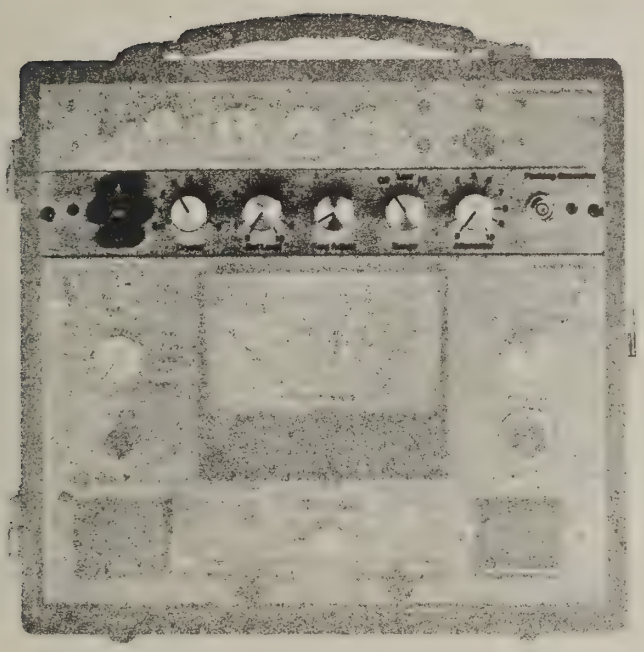
BT1	60B864085 or60K867953 or60B82455G01	BATTERY, dry: 1-1/2 v; "D" size cell; 4 req'd

NOTE:

Replacement diodes and transistors must be ordered by Motorola part number only for optimum performance.

PEAKING GENERATOR

MODEL SLN6057A/B



1. DESCRIPTION

The Model SLN6057A/B Peaking Generator is a crystal-controlled signal source which provides r-f signals ranging from 4 mc to 960 mc. The generator is used for peaking of the r-f stages of FM communications receivers operating within the 4 to 960 mc range. It also provides normally encountered intermediate frequencies for alignment of receiver i-f stages.

The peaking generator essentially consists of a transistorized oscillator, internal and external crystal sockets, tuned circuits and front mounted controls and switches. It requires a separate 6 volt d-c power source. The transistorized oscillator will operate properly only with anti-resonant crystals.

The peaking generator comes already mounted in the S1057A/B and the S1059A/B Portable Test Sets. It may also be purchased as a separate item to be mounted in the TU546, S1056A/B, or the S1058A/B Portable Test Sets. When mounted in the test set housing, the generator uses the battery supply built into the test set.

Refer to paragraph 7, INSTALLATION, for installing the SLN6057A/B Peaking Generator in the TU546, S1056A/B, or S1058A/B Portable Test Set.

If the test set is used at one location and the generator is required at another location, the generator may be removed from the test set housing. A metal cover, which is part of the generator, protects the generator components when it is removed from the test set housing. To provide operating voltages, the generator can then be connected to any 6 volt d-c battery.

GUARANTEED PERFORMANCE SPECIFICATIONS

PEAKING GENERATOR

MODEL	SLN6057A/B
FREQUENCY	crystal controlled output from 4 mc through 960 mc
TRANSISTOR COMPLEMENT & FUNCTION	(1) oscillator
POWER SUPPLY	6 v d-c

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REVISIONS

CHASSIS AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
SLN6056A	BT1	WAS 60B852116	Q1
	C3	WAS 23C855013	Q1 BASE
	M1	WAS 72D855099	S6 SWITCH
	Q1	WAS 48R134545	VOLTMETER AMPL.
		ADDED NOTE	PARTS LIST
SLN6056A	BT1	REMOVED FROM MODEL SLN6056A TEST SET KIT	PARTS LIST
SLN6082A	BT1	BATTERY KIT ADDED	
SLN6082A	BT1	ADDED ALTERNATE PART 60B82455G01	PARTS LIST
SLN6056A-1	R8	WAS 6R5676	S4 SWITCH
	R29	ADDED	
	R30	ADDED	
SLN6056A-2	C1	WAS 8K834384	S3 SWITCH
SLN6056A-3		ADD BLU-RED LEAD	J2-14
		ADD BLU-YEL LEAD	J2-12
SLN6056A-4	R31	ADDED 17.5K	P-1-12
		REMOVE JUMPER BETWEEN S1B-6 AND S1B-8	
	CR1 thru CR4	FROM 48C847274 TO 48-82139G01	PARTS LIST
	CR5, 6	FROM 48B857965 TO 48-82392B03	
	Q1, 2	FROM 48A124326 TO 48-869571, M9571	
SLN6056B SLN6082B		MODELS ADDED	

PARTS LIST for Schematic Diagram 63E81011A03-E

SLN6056A/B Portable Test Set

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		BATTERY, dry:
BT2	60B855262	1-1/2 volt; "N" size cell
		CAPACITOR, fixed:
C1	8D82905G12	mylar .22 ±10%; 50 v ±20%; 200 v
C2, 12, 13, 14	21B801139	ceramic; disc; .01 uf +80-20%; 600 v
C3, 4, 5, 8	23C844927 or23C82601A03	Electrolytic; tubular; 20 uf +100-10%; 25 v
C6, 7	21B847070	ceramic; disc; 800 uuf ±10%; 600 v
C9, 10	21R114166	ceramic; disc; 30 uuf ±10%; 500 v
C11	21K851299	ceramic; disc; 600 uuf ±10%; 600 v
C15	21R124554	ceramic; disc; 22 uuf ±5%; 500 v
C16	21R410063	ceramic; disc; 10 uuf ±5%; 500 v
C17	21K852185	ceramic; disc; 36 uuf ±5%; 500 v
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
CR1, 2, 3, 4	48-82139G01	germanium
CR5, 6	48-82392B03	silicon
		CONNECTOR, receptacle:
J1	9B16345	female; 4 cont; polarized round molded phenolic insulator chassis mounted
J2	28B855267	male; 20 cont; polarized; rect. molded black phenolic insulator; saddle mounted
		JACK, telephone:
J3	9B855279	contact arrangement of stacks, 2 form "B"
		CONNECTOR, receptacle:
J4	9B855268	female; single cont.; round molded insulator 50 ohm imped. chassis mounted
		COIL, RF:
L1	24B801876	choke; 20 mh; coded BLUE dot
		SPEAKER, magnetic:
LS1	50C855098	voice coil imped. 3.2 ohm; 3 w PM type; 2" x 3"
		METER, multi-scale:
M1	72D82534D01	panel mounted; c/o 20-0-20, 0-50 ua; 0-1000 v dc; 0-15 v dc; 0-30 v dc; 0-2 v ac
		CONNECTOR, plug:
P1	9B855266	female; 20 cont; polarized; rect. molded black phenolic insul; cable mounted
P2	28B813576	male; 11 cont; polarized; round molded black phenolic insulator; does not incl; 1V858293 SHELL, con. & handle & 41A483715, SPRING, con shell ret; shell & spring must be ordered separately
		TRANSISTOR: (SEE NOTE)
Q1, 2	48-869571	PNP; type M9571
Q3	48R134545	PNP; type M4545
		RESISTOR, fixed: carbon; unl stated
R1, 9	6K855337	17.5K ±2%; 1/2 w
R2	6K892455	20 megohm ±2%; 2 w
R3, 5	6K855329	300K ±2%; 1/2 w
R4	6K855330	600K ±2%; 1/2 w
R6	6K855332	360K ±2%; 1/2 w
R7	17K82839	wire-wound; 3 ohm; ±10%; 5 w
R8	6R488026	22 ohm ±10%; 1 w
R10	6R6048	47K ±10%; 1/2 w
R11	18K848202	var; 25K ±20%; .2 w
R12	6K855331	30K ±2%; 1/2 w
R13	6R115017	11K ±5%; 1/2 w
R14, 17	6R5581	3.3K ±10%; 1/2 w
R15, 18	6R6229	1K ±10%; 1/2 w
R16	18C855263	var; wire-wound; 5K ±20%; 1 w
R19	6R6040	680 ohm ±10%; 1/2 w
R20, 21, 22	6R6069	2.2K ±10%; 1/2 w
R23	6R6038	1.5K ±10%; 1/2 w
R24	6R2089	1.8K ±10%; 1/2 w
R25	6R5659	3.9K ±10%; 1/2 w
R26, 27	6R5591	18K ±10%; 1/2 w
R28	6R5554	390 ohm ±10%; 1/2 w
R29	17K852457	wire-wound; 5 ohm ±10%; 5 w
R30	17K863951	wire-wound; 3 ohm ±10%; 3 w
R31	6K855337	17.5K ±5%; 1/2 w
		SWITCH, rotary:
S1	40C855097	2 sect; cont; non-shorting
S2	40B855095	3 sect; 3 posi; non-shorting
S6	40B855093	2 sect; 5 posi; non-shorting
		SWITCH, lever:
S3	40B855094	1 sect; 3 posi; non-shorting
S4	40B855096	1 sect; 3 posi; shorting
		SWITCH, push:
S5	40C848230	cont; 2 form "A"; non-locking
		CABLE ASSEMBLY, special purpose
W1	1V858292	incl; 30B474498 CABLE, 12 cond; rubber covered; 50" length req'd; 10M519 WIRE, elec; single cond #24 ga. sol.; 1" req'd Ref parts P1, P2)
		CRYSTAL UNIT, quartz:
Y1		Not supp; when odering refer to Table 2, pg. 5 for freq. & type
Y2	Type AQL	455 kc
		SOCKET, crystal;
XY1	9K857508	female; 4 cont; sq. molded black bakelite base; chassis mounted
XY2	9K857509	female; 2 cont; rect. molded black bakelite base; chassis mounted
		NON-REFERENCED ITEMS
	13A855076	GRILLE, speaker
	36A855276	BUTTON, lever, 2 req'd; for ref. parts S3, S4
	36A855070	KNOB, control: 2 req'd; for ref parts S1, S2
	36A855071	KNOB, control; for ref. part S6
	55A855264	FASTENER, adjustable pawl R.H.
	55K855265	FASTENER, adjustable pawl L.H.
	58B855270	ADAPTER: UHF to BNC
	1V855413	ACCESSORY CABLE ASSEMBLY: Incl: 30A76858 CABLE, special purpose; 2 cond; rubber covered; 4 ft. length req'd; 28A855277 PLUG, telephone black handle 28K855278 PLUG, telephone red handle
	1V855414	RF TEST LEAD ASSEMBLY: incl; 30B475378 CABLE, RF: coaxial RG-58A/U; 4 ft length req'd; 28B844876 CONNECTOR, plug: single cont. 2 req'd
	1V855415	RF PROBE ASSEMBLY; incl; 30B475378 CABLE, RF; coaxial RG-58A/U; 1 ft. length req'd; 9B855269 JACK, telephone
	1V855404	METER PANEL ASSY. (Riveted)
	1V855411	METER PANEL COVER ASSY.: (Riveted)
	1V867350	CASE ASSY.: Incl. 16E855419 CASE, test set; 42B861758 HOLDER, battery; 7A82479 BRACKET

SLN6082A/B Battery Kit

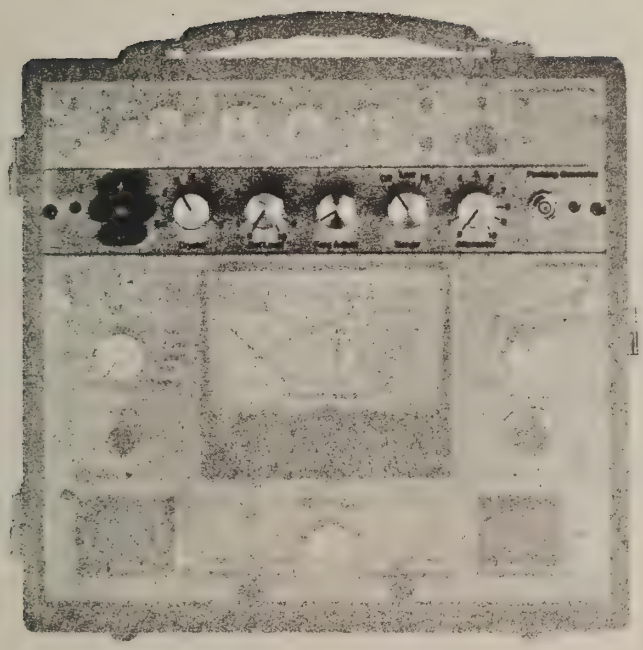
BT1	60B864085 or60K867953 or60B82455G01	BATTERY, dry: 1-1/2 v; "D" size cell; 4 req'd

NOTE:

Replacement diodes and transistors must be ordered by Motorola part number only for optimum performance.

PEAKING GENERATOR

MODEL SLN6057A/B



1. DESCRIPTION

The Model SLN6057A/B Peaking Generator is a crystal-controlled signal source which provides r-f signals ranging from 4 mc to 960 mc. The generator is used for peaking of the r-f stages of FM communications receivers operating within the 4 to 960 mc range. It also provides normally encountered intermediate frequencies for alignment of receiver i-f stages.

The peaking generator essentially consists of a transistorized oscillator, internal and external crystal sockets, tuned circuits and front mounted controls and switches. It requires a separate 6 volt d-c power source. The transistorized oscillator will operate properly only with anti-resonant crystals.

The peaking generator comes already mounted in the S1057A/B and the S1059A/B Portable Test Sets. It may also be purchased as a separate item to be mounted in the TU546, S1056A/B, or the S1058A/B Portable Test Sets. When mounted in the test set housing, the generator uses the battery supply built into the test set.

Refer to paragraph 7, INSTALLATION, for installing the SLN6057A/B Peaking Generator in the TU546, S1056A/B, or S1058A/B Portable Test Set.

If the test set is used at one location and the generator is required at another location, the generator may be removed from the test set housing. A metal cover, which is part of the generator, protects the generator components when it is removed from the test set housing. To provide operating voltages, the generator can then be connected to any 6 volt d-c battery.

GUARANTEED PERFORMANCE SPECIFICATIONS

PEAKING GENERATOR

MODEL	SLN6057A/B
FREQUENCY	crystal controlled output from 4 mc through 960 mc
TRANSISTOR COMPLEMENT & FUNCTION	(1) oscillator
POWER SUPPLY	6 v d-c

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2. CONTROLS

a. CRYSTAL

The CRYSTAL switch is a 9 position switch located on the front of the generator. Positions 1 through 8 correspond to eight numbered internal crystal positions, which permit selection of up to eight test frequencies.

The EXT. position on the switch selects the three external crystal sockets. Only one crystal should be used at a time when using the EXT. position.

An anti-resonant, ovenized transmitter control crystal may be used without using the crystal heater.

b. SET LEVEL and ATTENUATOR

Operation of the SET LEVEL and ATTENUATOR varies the amount of oscillator current, which also controls the output level of the generator.

CAUTION

Some frequency shift may be encountered with adjustment of the SET LEVEL or ATTENUATOR

The ATTENUATOR is a smaller adjustable resistance which is useful in adjusting the output of the 890-960 mc tuned circuit to a pre-determined level and also for making fine adjustments of the SET LEVEL. Both controls are labeled from 0 to 10. This labeling enables re-setting of the controls after they have been checked against a signal generator of known accuracy or against the diode current reading indicated on the portable test set meter.

c. FREQ. ADJUST

The FREQ. ADJUST control provides fine tuning correction (warping) of the crystal frequency. This control should be used only to "zero" the crystal frequency. It is important to note that a change in frequency may cause a change in the output level.

d. RANGE

Operation of the RANGE switch selects a warping circuit for a range of crystal frequencies and also selects the proper output circuit to correspond to the frequency range.

Position OFF - Battery circuit is opened. This position is useful in checking quieting reference level.

Position LO - Crystals from 4 to 8 mc. This position provides a useful harmonic output up to 470 mc for alignment of receivers in the 25 to 470 mc range.

Position HI - Crystals from 9 to 9.6 mc. This position provides a useful harmonic output from 890 to 960 mc.

To eliminate any low order harmonics which may be encountered in any of the intermediate frequency bands, when using positions LO or HI, the crystals available for use with the peaking generator are specially selected to prevent low order harmonic interference. An example of this is as follows: channel frequency - 420.0 mc crystal used - 7.0 mc. If this crystal is used in the peaking generator and the receiver being tested has a first i-f of 21.0 mc, then the third harmonic of the crystal (3 x 7.0 mc = 21 mc) may interfere during the r-f alignment.

When using transmitter crystals, the possibility of i-f interference should be considered.

3. CALIBRATION

The peaking generator can be checked against a signal generator of known accuracy using an FM communications receiver as a tuned voltmeter.

a. Meter Discriminator and Limiter--connect the metering cable from the test set to the receiver.

b. Interconnect Signal Generator and Radio Set --connect the r-f probe from the signal generator to the antenna receptacle on the radio set.

c. Zero Signal Generator Frequency--set the signal generator to the exact receiver frequency.

d. Adjust Signal Generator Output--adjust output to approximately 1 microvolt. Note the limiter reading (Position Selector switch in position #2).

e. Replace Signal Generator with Peaking Generator--remove the signal generator cable and connect the peaking generator r-f cable to the antenna receptacle on the radio set.

f. Adjust Frequency to Exact Receiver Frequency--place the Position Selector switch in position #4. Adjust the frequency output of the peaking generator to the exact receiver frequency.

g. Adjust SET LEVEL and/or ATTENUATOR--adjust the SET LEVEL and/or ATTENUATOR for the same limiter reading as in step d. above. Recheck the FREQ. ADJUST. Record the exact position of the SET LEVEL and ATTENUATOR controls to eliminate the above procedures in subsequent receiver checking.

4. OUTPUT CIRCUITS

There is an adjustable capacitor in each output circuit. One circuit is peaked at approximately 460 mc (C1 on Schematic Diagram) and needs no further adjustment. The other circuit is repeaked between 890-960 mc (C2 on Schematic Diagram) and should be peaked for maximum output on the test frequency.

The trimmer capacitor C5, across the transistor emitter-base has been factory adjusted for maximum output and warp at 460 mc and should not require adjustment unless the transistor is replaced.

5. OPERATING INSTRUCTIONS

General procedures for setting up the peaking generator for r-f peaking of an FM communications receiver are as follows:

a. Rotate the CRYSTAL switch to select the crystal frequency to be used.

b. Place the RANGE switch in position LO or HI depending on the crystal fundamental frequency and the output frequency desired.

c. Adjust the SET LEVEL and the ATTENUATOR for the output level desired.

d. Rotate the FREQ. ADJUST to warp the crystal to the test frequency.

NOTE

When the Function Selector switch (on the Portable Test Set) is in ACCESS. position, the oscillator can be checked by observing the test set meter reading. The normal maximum reading should not be less than 10 microamperes. The reading depends to some extent on the condition of the batteries and the crystal used. The batteries may be checked by placing the Position Selector switch on the test set to position #13 (Function Selector switch in RCVR or XMTR).

To conserve battery life when the generator is not in use, place the RANGE switch in the OFF position. The batteries are also disconnected from the peaking generator circuit when the 20-pin metering plug is not plugged into the 20-pin receptacle in the test set.

6. CRYSTALS

Crystals are not supplied with the peaking generator, but are available on separate order. RF outputs ranging in frequency from 4 to 960 mc are produced from crystals which range in frequency from 4 to 9.6 mc. The frequency of the crystal required to produce the desired r-f output must be calculated from the formulas given in Table 1. In general, any anti-resonant type transmitter crystal may be used if the frequency is correct.

A maximum of 9 crystals may be plugged into the 8 internal sockets and 3 external sockets (only one of the external sockets may be used at a time because all three are connected in parallel). The 8 internal sockets and one of the external sockets (XY5) will accept ANL, AUL, or AULX type crystals. Another external socket (XY6) accepts SFMT type crystals, and the remaining external socket (XY7) takes AN type crystals. After calculating the crystal frequency by using Table 1, the crystal type may be selected from Table 2. It is usually advantageous to choose an ANL, AUL, or AULX type since these types fit in either the internal or external sockets. When ordering, give both the type and frequency of the crystal desired.

TABLE 1

Crystal Calculations for SLN6057A/B Peaking Generator

Fc = Desired generator output frequency
Fx = Crystal Frequency required

Fc	Fx	Fc	Fx	Fc	Fx	Fc	Fx
4-8 mc	Fx = Fc	48-54 mc	Fx = Fc/8	134-141 mc	Fx = Fc/19	407-423 mc	Fx = Fc/54
8-15 mc	Fx = Fc/2	54-65 mc	Fx = Fc/9	141-147 mc	Fx = Fc/20	423-438 mc	Fx = Fc/56
25-30 mc	Fx = Fc/4	65-72 mc	Fx = Fc/10	147-154 mc	Fx = Fc/21	438-452 mc	Fx = Fc/58
30-36 mc	Fx = Fc/5	72-80 mc	Fx = Fc/11	154-161 mc	Fx = Fc/22	452-470 mc	Fx = Fc/60
36-42 mc	Fx = Fc/6	80-90 mc	Fx = Fc/12	161-174 mc	Fx = Fc/23	890-920 mc	Fx = Fc/97
42-48 mc	Fx = Fc/7	127-134 mc	Fx = Fc/18	393-407 mc	Fx = Fc/52	920-960 mc	Fx = Fc/100

TABLE 2

Crystal Type Available and Their Frequency Range

Crystal Frequency	Motorola Type
2000-6000 kc	ANL and AN
6000-10000 kc	AUL and AULX
10000-13000 kc	ANL and AN

7. INSTALLATION

a. Portable Test Set

The front panel of the TU546 and the S1056A/B Portable Test Set has two removable panels. The open partition provided by removal of the lower panel is for mounting the peaking generator.

The front panel of the S1058A/B Portable Test Set has one removable panel. This is located between the Deviation Meter Panel and the meter face. The removal of this panel provides the open partition for mounting the peaking generator.

Open the front of the test set. Insert the four wires through the hole in the corner of the partition and then through the same sleeving as the battery wires. Connect the four wires from the generator to the test set as follows:

(1) Connect the BLACK-GREEN wire to the BLACK-GREEN wire on the oscillator and meter reversing switch.

(2) Connect the RED-BLACK wire to the RED-BLACK wire on the oscillator and meter reversing switch.

(3) Connect the ORANGE wire to pin #19 on the 20-pin receptacle.

(4) Connect the GREEN wire to pin #13 on the 20-pin receptacle.

b. Separate Mounting

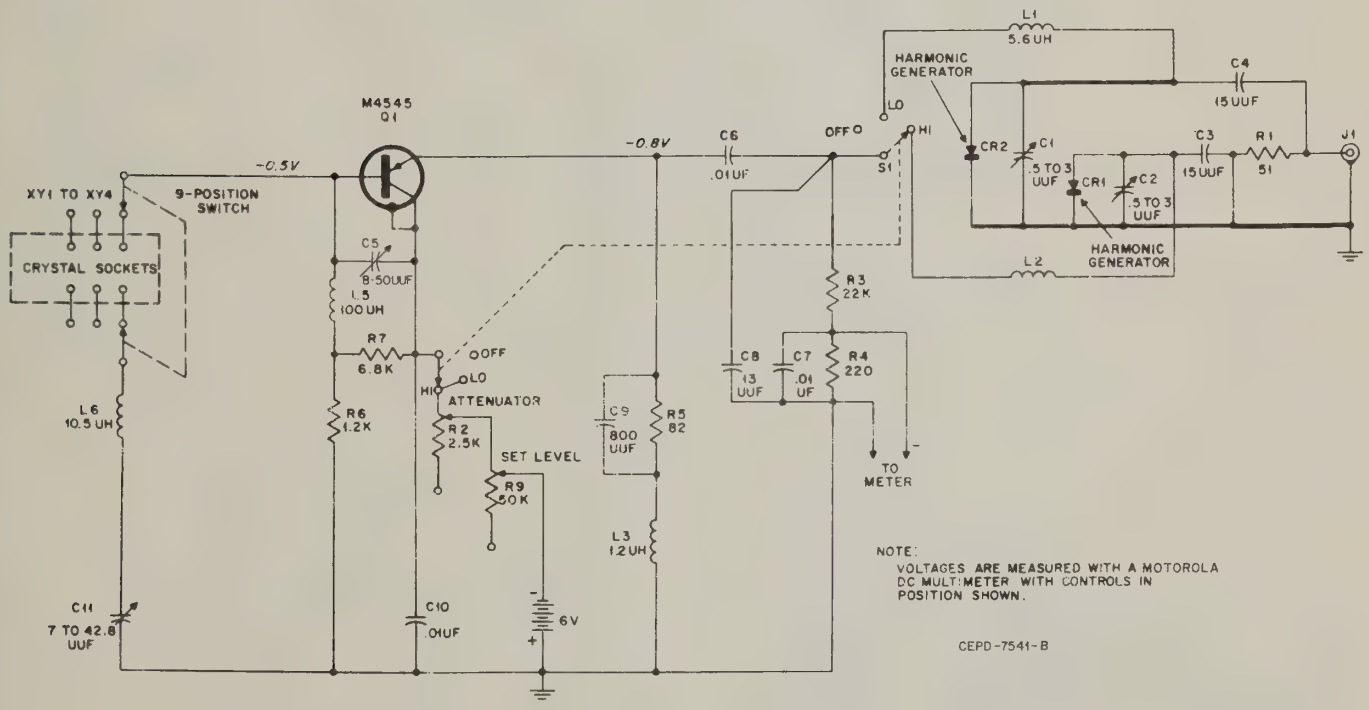
If the peaking generator is to be installed in any place other than in the portable test set housing, make the electrical connections as follows:

(1) Connect the BLACK-GREEN wire from the generator to the positive terminal of a 50 microampere meter.

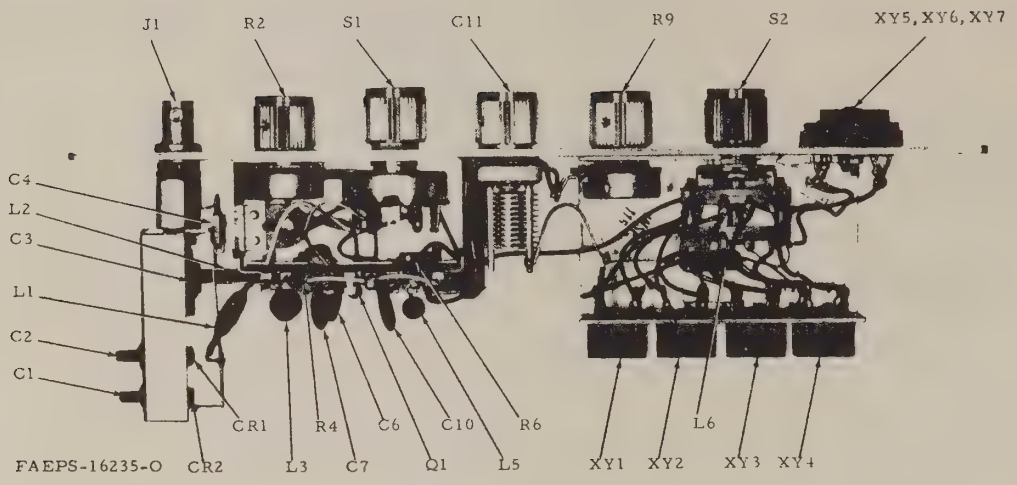
(2) Connect the RED-BLACK wire to the negative terminal of a 50 microampere meter.

(3) Connect the GREEN wire to the negative terminal of a 6 volt d-c source.

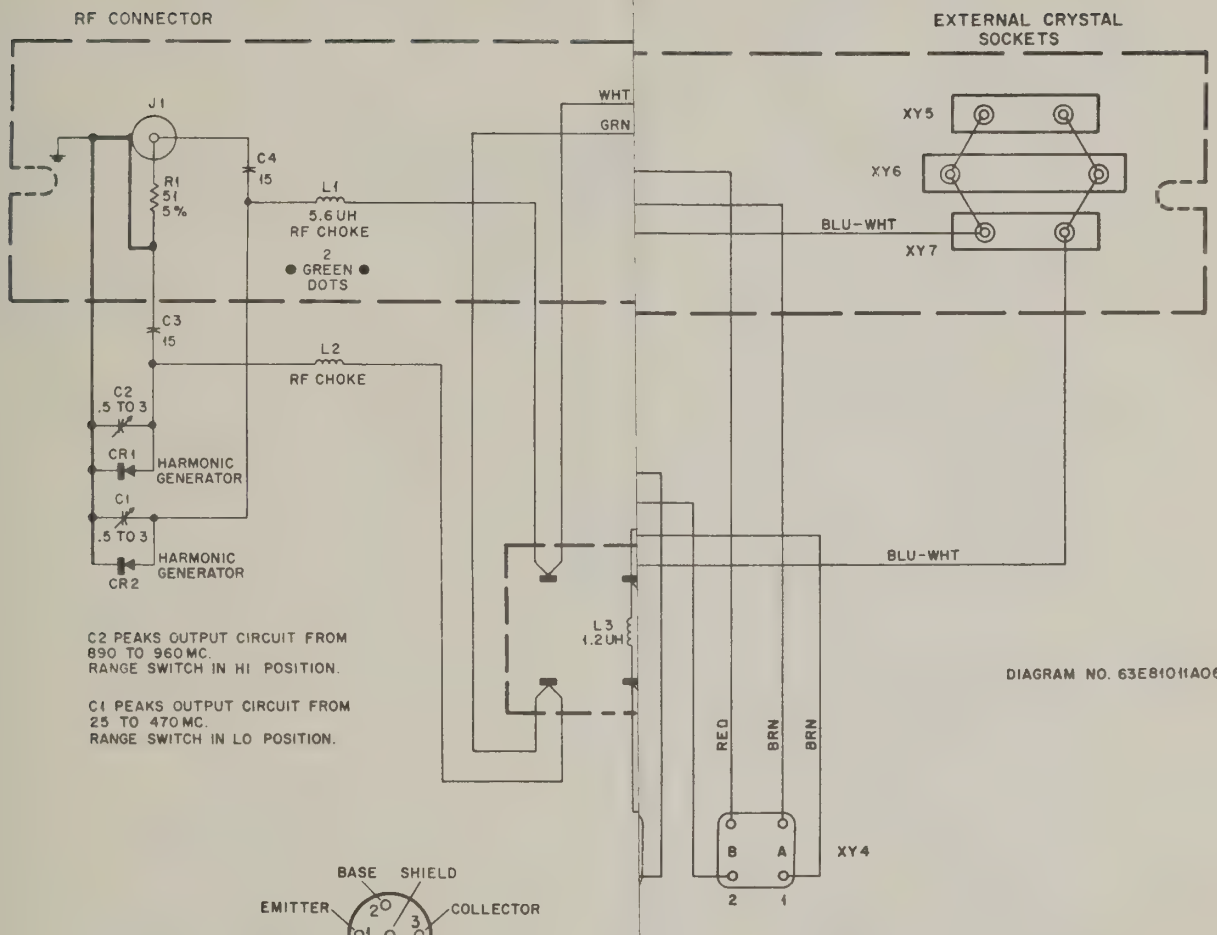
(4) Connect the ORANGE wire to the positive terminal of the 6 volt d-c source.



SLN6057A/B Peaking Generator
Simplified Circuit Diagram



Model SLN6057A/B
Peaking Generator



MODEL TABLE

MODEL	SUFFIX	DESCRIPTION
SLN6057A/B		PEAKING GENERATOR
S1057A/B		PORTABLE TEST SET(WITH PEAKING GENERATOR)
S1059A/B		PORTABLE TEST SET(WITH PEAKING GENERATOR & DEVIATION METER)

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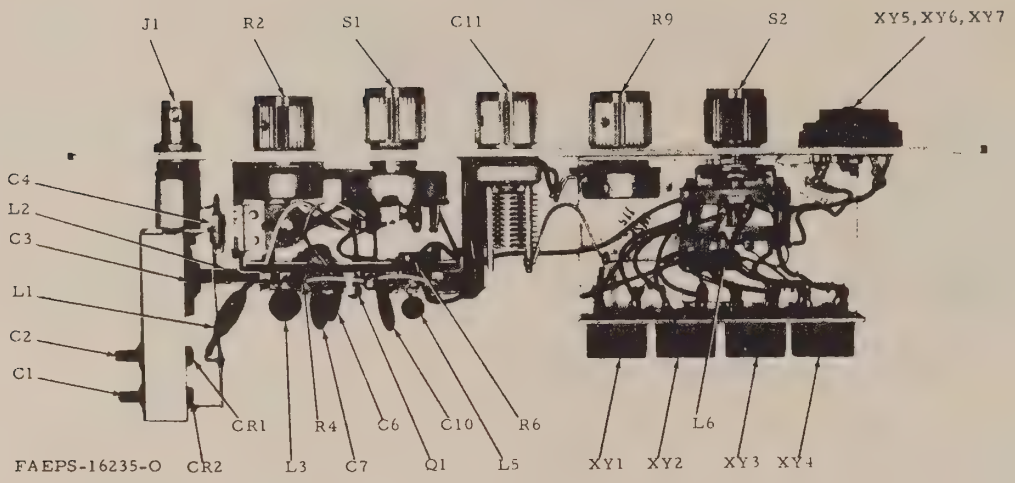
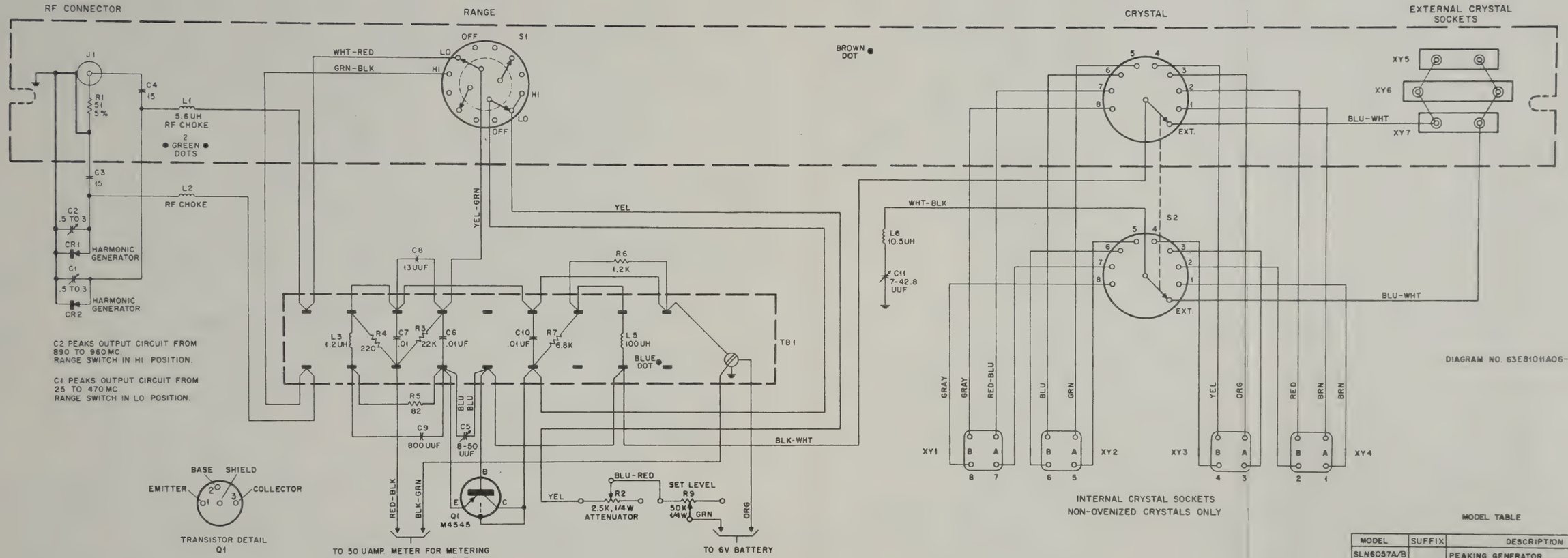
SLN6057A/B Peaking Generator
Schematic Diagram
Motorola No. 63E81011A06-A



Model SLN6057A/B
Peaking Generator



IF USED WITH TU546, S1056A/B OR S1058A/B TEST SET:

(1) CONNECT BLK-GRN TO BLK-GRN WIRE ON METER REV. SWITCH (S6).

(2) CONNECT RED-BLK TO RED-BLK WIRE ON METER REV. SWITCH (S6).

IF USED WITH TU546, S1056A/B OR S1058A/B TEST SET:

(1) CONNECT ORG TO PIN NO. 19 ON 20-PIN RECEPTACLE.

(2) CONNECT GRN TO PIN NO. 13 ON 20-PIN RECEPTACLE.

NOTES:

1. VOLTAGE READINGS TAKEN WITH ATTENUATOR AND SET LEVEL CONTROLS FULLY CLOCKWISE.
2. ALL RESISTORS ARE INDICATED IN OHMS, 1/2W, UNLESS OTHERWISE STATED.
3. ALL CAPACITORS ARE INDICATED IN MICROMICROFARADS UNLESS OTHERWISE STATED.

DIAGRAM NO. 63E81011A06-A

MODEL TABLE

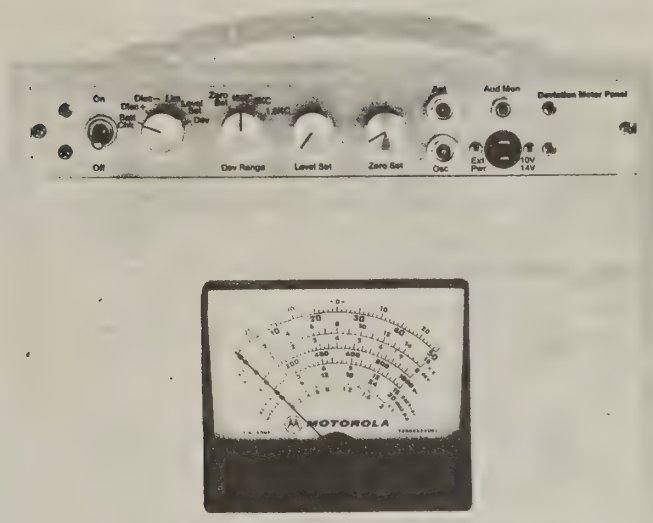
MODEL	SUFFIX	DESCRIPTION
SLN6057A/B		PEAKING GENERATOR
S1057A/B		PORTABLE TEST SET(WITH PEAKING GENERATOR)
S1059A/B		PORTABLE TEST SET(WITH PEAKING GENERATOR & DEVIATION METER)

SLN6057A/B Peaking Generator
Schematic Diagram
Motorola No. 63E81011A06-A

DEVIATION METER PANEL
MODEL SLN1000A/B

AND

CONVERSION KIT
MODEL S1062A/B



1. DESCRIPTION

The Model SLN1000A/B Deviation Meter is a transistorized receiver for measuring the deviation of FM transmitters in the 20 to 500 mc frequency range. A Model SLN6057A/B Peaking Generator or S1341A or S1342A Signal Generator (or equivalent) is required for the local oscillator.

The deviation meter has its own internal power supply which consists of two 6-1/2-volt mercury batteries. If desired, an external power supply can be used in place of the batteries.

The unit is mounted in the S1058A/B and S1059A/B Portable Test Sets. Refer to paragraph 8, CIRCUIT DESCRIPTION, for a more detailed circuit description.

The Model S1062A/B Deviation Meter Conversion Kit is used to add a deviation meter panel to the Motorola Model TU546, TU546P, S1056A/B or S1057A/B Portable Test Set. The kit includes a Motorola Model SLN1000A/B Deviation Meter Panel and a panel meter (Motorola Model SLN6062A). Since the meter must be calibrated with the deviation meter panel, the original meter in the test set must be replaced with the meter supplied in the conversion kit.

MOTOROLA INC. Communications Division
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REVISIONS

63E81011A06-A

CHASSIS AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
SLN6057A	S2	FROM 40B858122 TO 40-82557F01	PARTS LIST
SLN6057B		MODEL ADDED	MODEL TABLE

PARTS LIST for Diagram 63E81011A06-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		CAPACITOR, fixed: unl stated
C1, 2	20A858351	var: 0.5 uuf min. to 3 uuf max.
C3	1V858438	assy; incl 21K835358 CAPACITOR, fixed: 15 uuf ±10%; 500 v 42A858406 CLIP, mtg.
C4	1V858439	assy; incl 21K835358 CAPACITOR, fixed: 15 uuf ±10%; 500 v 42A858404 CLIP, mtg.
C5	20K840719	var; 8-50 uuf
C6, 7, 10	21B801139	.01 uf +80-20%; 600 v
C8	21K865358	13 uuf ±5%; 500 v
C9	21B847070	800 uuf ±10%; 600 v
C11	19A475604	var: 7 uuf min. to 42.8 uuf max.
		SEMICONDUCTOR DEVICE, diode: SEE NOTE
CR1, 2	48A82616B01	germanium (factory selected)
		CONNECTOR, receptacle:
J1	9B855268	female; single contact; type BNC
		COIL, RF: choke;
L1	24A813564	5.6 uh; coded GRN-GRN
L2	24B858421	60 turns
L3	24K800899	1.2 uh
L5	24A832402	100 uh; coded BLU
L6	24K859163	10.5 uh
		TRANSISTOR: SEE NOTE
Q1	48R134545	P-N-P; type M4545
		RESISTOR, fixed: ±10%; 1/2 w; unl stated
R1	6R5648	51 ±5%
R2	18K858468	var: 2.5K ±30%; 1/4 w
R3	6R6397	22K
R4	6R6270	220
R5	6R2035	82
R6	6R6393	1.2K
R7	6R6428	6.8K
R9	18K858469	var: 50K ±20%; 1/4 w
		SWITCH, rotary:
S1	40K801196 or 40B82391D01	4 pole; 3 position
S2	40-82557F01	2 pole; 9 position
		BOARD, terminal:
TB1	31A835961	18 solder lug terminals
		SOCKET, crystal: female;
XY1, 2, 3, 4	9K857508	4 contact
XY5	9K857509	2 contact
XY6	9K82810	2 contact
XY7	9K861367	2 contact

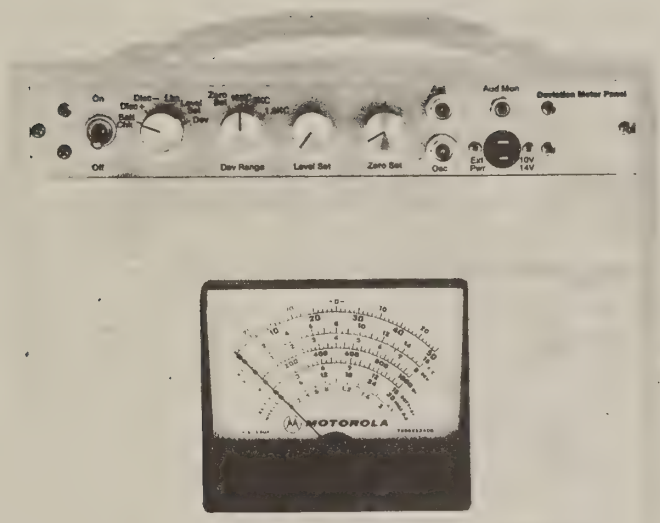
NOTE:

Replacement transistors and diodes must be ordered by Motorola part number only for optimum performance.

DEVIATION METER PANEL
MODEL SLN1000A/B

AND

CONVERSION KIT
MODEL S1062A/B



1. DESCRIPTION

The Model SLN1000A/B Deviation Meter is a transistorized receiver for measuring the deviation of FM transmitters in the 20 to 500 mc frequency range. A Model SLN6057A/B Peaking Generator or S1341A or S1342A Signal Generator (or equivalent) is required for the local oscillator.

The deviation meter has its own internal power supply which consists of two 6-1/2-volt mercury batteries. If desired, an external power supply can be used in place of the batteries.

The unit is mounted in the S1058A/B and S1059A/B Portable Test Sets. Refer to paragraph 8, CIRCUIT DESCRIPTION, for a more detailed circuit description.

The Model S1062A/B Deviation Meter Conversion Kit is used to add a deviation meter panel to the Motorola Model TU546, TU546P, S1056A/B or S1057A/B Portable Test Set. The kit includes a Motorola Model SLN1000A/B Deviation Meter Panel and a panel meter (Motorola Model SLN6062A). Since the meter must be calibrated with the deviation meter panel, the original meter in the test set must be replaced with the meter supplied in the conversion kit.

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ENGINEERING PUBLICATIONS 1301 E. ALGONQUIN ROAD SCHAUMBURG, ILLINOIS 60172

GUARANTEED PERFORMANCE SPECIFICATIONS

MODEL		SLN1000A/B
CARRIER FREQUENCY RANGE		20 to 500 mc
DEVIATION RANGES		16 kc, 8 kc & 1.6 kc full scale
ACCURACY	16 KC RANGE	±5% at 15 kc, ±5% of full scale otherwise
	8 KC RANGE	±5% at 5 & 6.67 kc, ±5% of full scale otherwise
	1.6 KC RANGE	±10% of full scale (for "Private-Line" tones up to 400 cps)
SENSITIVITY WITH PEAKING GENERATOR	25-54 MC	1 millivolt
	144-174 MC	3 millivolts
	450-470 MC	20 millivolts
SENSITIVITY WITH .1 V SIGNAL GEN. ON FUNDAMENTALS	25-54 MC	1 millivolt
	144-174 MC	3 millivolts
	450-470 MC	20 millivolts
DEVIATION READING		1/2 x (sum of pos. and neg. peaks)
OPERATING TEMPERATURE RANGE	MERCURY BATTERIES	+10°C to +50°C
	EXTERNAL POWER	0°C to +50°C
BATTERY LIFE		40 hours with SLN6046A/B Mercury Battery Kit (room temperature)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

For installation information, refer to paragraph 11, INSTALLING THE CONVERSION KIT.

2. OPERATING INSTRUCTIONS

a. Test Set Controls

(1) Place the position selector switch in position 15.

(2) Place the function selector switch in RCVR or XMTR position.

b. Deviation Meter Panel

(1) Connect the antenna to ANT. connector. See paragraph 5, INPUT SIGNAL REQUIREMENTS.

(2) Connect earphones (1000 ohms) or an oscilloscope to the AUD. MON. jack. A phone plug is supplied for this purpose.

(3) Place the function switch in the BATT. CHK. position. Meter indication should be at or above the red line (10.5 on 16 kc deviation scale).

(4) Connect an external oscillator to the OSC. connector. The Motorola Model TK589 or SLN6057A/B Peaking Generator or Model S1341A or S1342A Signal Generator or equivalent may be used.

(a) TK589 or SLN6057A/B Peaking Generator

1. Calculate the crystal frequency using the applicable formula in TABLE 1 and insert crystal in the appropriate socket on the peaking generator.

Table 1.

Fc (MC)	Fx	Fc (MC)	Fx
25-30	$Fx=\frac{Fc \pm .455}{4}$	134-141	$Fx=\frac{Fc \pm .455}{19}$
30-36	$Fx=\frac{Fc \pm .455}{5}$	141-147	$Fx=\frac{Fc \pm .455}{20}$
36-42	$Fx=\frac{Fc \pm .455}{6}$	147-154	$Fx=\frac{Fc \pm .455}{21}$
42-48	$Fx=\frac{Fc \pm .455}{7}$	154-161	$Fx=\frac{Fc \pm .455}{22}$
48-54	$Fx=\frac{Fc \pm .455}{8}$	161-174	$Fx=\frac{Fc \pm .455}{23}$
54-65	$Fx=\frac{Fc \pm .455}{9}$	393-407	$Fx=\frac{Fc \pm .455}{52}$

Table 1. (Cont'd.)

Fc (MC)	Fx	Fc (MC)	Fx
65-72	$Fx=\frac{Fc \pm .455}{10}$	407-423	$Fx=\frac{Fc \pm .455}{54}$
72-80	$Fx=\frac{Fc \pm .455}{11}$	423-438	$Fx=\frac{Fc \pm .455}{56}$
80-90	$Fx=\frac{Fc \pm .455}{12}$	438-452	$Fx=\frac{Fc \pm .455}{58}$
127-154	$Fx=\frac{Fc \pm .455}{18}$	452-470	$Fx=\frac{Fc \pm .455}{60}$

Fx = Crystal Frequency
Fc = Transmitter Frequency

NOTE

When ordering crystals for the peaking generator to be used with the deviation meter, specify Motorola Type AULX and transmitter and/or crystal frequency.

2. Connect the output of the peaking generator to the OSC. connector on the deviation meter panel using the Motorola Model SKN6007A Cable Kit.

3. Adjust the SET LEVEL control for maximum output (fully clockwise).

4. Key the transmitter and adjust the FREQ. ADJUST control for zero meter indication with the function switch on the deviation meter panel in the DISC.+ or DISC.- positions.

5. Place the function switch on the deviation meter panel in the LIM. position and adjust the ATTENUATOR control on the peaking generator for maximum meter indication. Maximum setting of the ATTENUATOR control is not necessarily the position of maximum harmonic output and the control should be advanced from zero for a maximum reading in the LIM. position.

(b) S1341A or S1342A Series Signal Generator

1. Connect the output of the signal generator and the antenna to the antenna connector using a BNC "T" connector. Refer to paragraph 5, INPUT SIGNAL REQUIREMENTS.

2. Adjust the signal generator frequency to either 455 kc above or below the transmitter frequency.

3. Adjust the signal generator output attenuator for an output of approximately

30 millivolts. Key the transmitter and adjust the signal generator frequency for zero in DISC. + or DISC. -. Refer to paragraph 4, ERRONEOUS INDICATIONS.

(5) Place the function switch in the LEVEL SET position and key the transmitter (unmodulated except "Private-Line" tone in units equipped with this feature). Adjust the LEVEL SET control until the pointer is on the red line (10.5 kc on the deviation scale).

(6) Place the function switch in the DEV. position and the DEV. RANGE switch in the ZERO SET position. Adjust the ZERO SET control for zero meter indication.

(7) Place the DEV. RANGE switch in the applicable position (16KC for 15KC transmitters or 8 kc for 5 kc transmitters).

(8) Remove the "Vibrasender" reed from "Private-Line" transmitters. Key the transmitter preferably from the test set. The meter should indicate less than 0.5 kc on the 8KC range and less than 1.0 kc on the 16KC range for an unmodulated carrier. See paragraph 5, INPUT SIGNAL REQUIREMENTS.

(9) Replace the "Vibrasender" and modulate the transmitter with either the TEK-1B Tone Generator or by saying "aahhh" or "four" or any word which allows the deviation to remain constant. In "Private-Line" transmitters, the "Private-Line" deviation can then be checked in the 1.6KC range. If the deviation is not correct, refer to the instruction manual for the particular equipment being tested for information to reset it.

3. 960 MC TRANSMITTERS

The deviation meter is capable of measurement of transmitter deviation in units operating in the 960 mc band. These transmitters use 40 kc deviation, however, they also use multiplier stages preceding the final amplifier with a multiplication factor of 6. If deviation is measured at 1/6 the transmitter output frequency, the deviation at that frequency will be 6.67 kc. The 8 kc scale is marked at 6.67 kc for this purpose. A cable connected to the ANT. input on the deviation meter panel should be placed near the multiplier stage in the transmitter which is at 1/6 the transmitter output frequency and the same procedure as previously described can be followed.

When using the peaking generator, the "Fc" in the equations in Table 1 should be 1/6 the transmitter output frequency. When using the signal generator, the generator frequency should be set to 1/6 the transmitter output frequency.

4. ERRONEOUS INDICATIONS

It is possible to obtain an erroneous indication if the signal generator is not accurately calibrated. This response occurs at the transmitter frequency plus or minus 227.5 kc (1/2 x 455 kc) and results in a meter indication of twice the actual deviation. To avoid this, the generator output should be reduced until meter indication starts to decrease (function switch in LIM. position). The signal generator frequency should then be adjusted through a range of 500 kc above and below the transmitter frequency while watching for the presence of a stronger response. If a stronger response is located, the generator should be left at this frequency. The generator output level should then be increased until a further increase in output level results in no increase in meter indication. After completing this procedure, re-check the generator frequency by placing the function switch in the DISC. + or DISC. - positions. Readjust the generator frequency for zero meter indication if necessary.

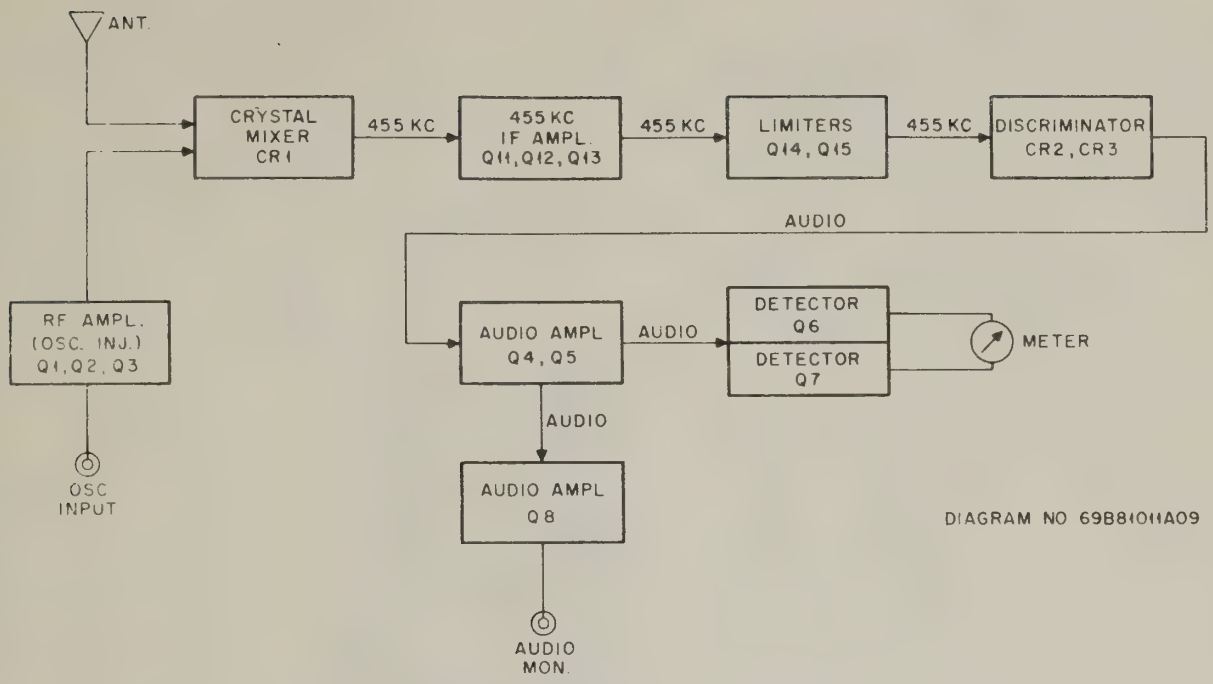
5. INPUT SIGNAL REQUIREMENTS

When receiving an unmodulated carrier (no voice or "Private-Line" tone), the deviation meter should indicate less than 0.5 kc on the 8KC range, or 1.0 kc on the 16KC range to insure an accurate reading. If the indications exceed the above amounts, the received signal is either too small or too great.

The Motorola Model SLN6080A Attenuator should be used on the deviation meter when it is used within 25 feet (35 feet for 450 mc transmitters) of the transmitting antenna. When not in close proximity to the antenna, the attenuator should be removed to obtain the full sensitivity of the deviation meter.

If the transmitter to be measured is accessible, it will be necessary to remove the "Vibrasender" reed to insure that a low deviation is obtained with an unmodulated carrier.

If a "Private-Line" transmitter is inaccessible and, therefore, some distance away, a



Deviation Meter Block Diagram

check for sufficient signal can be made by attaching a clip lead to the antenna of the deviation meter. If the limiter position reading does not increase when adding the clip lead to the antenna of the deviation meter, the signal strength is sufficient to make an accurate measurement of deviation.

6. AUDIO MONITORING

The "AUD. MON." jack on the deviation meter panel is used to monitor the recovered modulation. An earphone (1000 ohms) or an oscilloscope should be connected to the jack. This is necessary in order that an interfering signal can be detected. It is also useful when a signal generator is used for a local oscillator to determine approximately the proper frequency before fine adjustment is made in DISC.+ or DISC.

7. EXTERNAL POWER SUPPLY

A connector is provided on the deviation meter panel to enable the unit to be powered from an external source if desired. The Motorola Model S1303A, S1305A, T1012A or T1064A Power Supply with the TEK-15A Ripple Filter or a 10 to 14 V dc battery which is capable of 25 mA of current may be used.

CAUTION

Damage to the equipment may result if voltages in excess of the 14 V dc are used.

The wide pin on the connector must be connected to the positive (+) terminal of the external supply and the narrow pin must be connected to the negative (-) terminal.

Use the ON-OFF switch on the deviation meter panel to turn the equipment off after use. The internal batteries will continue to power the unit if the external power is disconnected and the switch is left in the ON position. If desired, one of the internal batteries can be removed and inserted only when the unit is to be used in the field or when an external power source is not available.

Before using an external power supply, with the internal batteries in place, put the function switch in BATT. CHK. position. Plug in the external source and note the meter reading. It should be between 45-47.5 microamperes on the 0-50 scale (second from top). If the meter indication is less than 45 microamperes, the internal batteries are powering the unit. If the meter reading is greater than 47.5 microamperes, damage to the unit may occur.

8. CIRCUIT DESCRIPTION

As shown on the block and schematic diagrams, the deviation meter is a single conversion FM receiver without a local oscillator. Rf signals reaching the antenna enter the crystal mixer to heterodyne with the output of an external oscillator to produce a 455 kc intermediate frequency containing the original modulation. Two stages of amplification and an impedance matching stage are inserted between the oscillator input and the crystal mixer. The 455 kc signal passes through three stages of amplification and two limiters before entering the discriminator where frequency deviation is converted to an audio signal. The output from the discriminator enters a two stage audio amplifier using negative feedback. The feedback and temperature compensation prevent large variations in gain resulting from variations in transistor parameters and supply voltage. The output of the audio amplifier enters the detector stages where a peak deviation is detected regardless of waveform. These stages have a fast charge characteristic in conjunction with a slow discharge characteristic to permit detection of voice modulation. However, due to the large peak-to-average voltage characteristics of voice modulation, sine wave modulation is the most accurate for deviation measurement. The output of the detectors is measured by a peak reading voltmeter which is calibrated to read half of the peak-to-peak deviation.

A third audio amplifier stage is connected to the output of the first two audio stages and its output is connected to a jack for monitoring purposes.

9. CALIBRATION

Accuracy of the instrument will be maintained with periodic calibration. This should be accomplished only by qualified personnel having adequate facilities. If desired the instrument may be returned to the factory for calibration. Return to:

Motorola Communications & Electronics, Inc.
Parts and Service Department
1313 E. Algonquin Road
Schaumburg, Illinois 60172

10. MAINTENANCE

This instrument should be serviced only by qualified personnel experienced in repairing instruments. If qualified personnel is not available, the instrument may be returned to the factory for servicing.

a. Battery Replacement

(1) Remove the two screws from the extreme edges of the front panel and pull out the deviation meter panel.

(2) Loosen the screw at back of the cover under which the battery cover is secured.

(3) Remove the batteries and replace with fresh batteries with the polarity as shown.

(4) Replace battery cover.

b. To Remove the Cover

(1) Remove the two screws at the back face of the unit.

(2) Remove one of the batteries.

(3) Loosen the two screws in the middle of the battery board.

(4) Pull back the cover.

11. INSTALLING THE CONVERSION KIT

The following steps outline the procedure necessary to complete the installation.

a. Meter

Remove the existing meter and replace with meter supplied.

b. Deviation Meter Panel

Refer to the Installation Detail while performing the following steps.

NOTE

Steps (1) through (4) apply to the Model TU546 & TU546P Portable Test Sets only.

(1) Unsolder the 17.5K precision resistor (R9) and the WHT-BLU jumper from S1B-15.

(2) Remove jumper between S1B-14 and S1B-15.

(3) Resolder R9 and the WHT-BLU jumper to S1B-14.

(4) Remove BLU-YEL wire from S1A-15 and tape the end. This wire is no longer used.

(5) Mount the SLN1000A/B Deviation Meter Panel in place of blank panel at top of test set. Route WHT-RED and WHT-BLK leads along existing battery cable to S1B-15 and S1A-14.

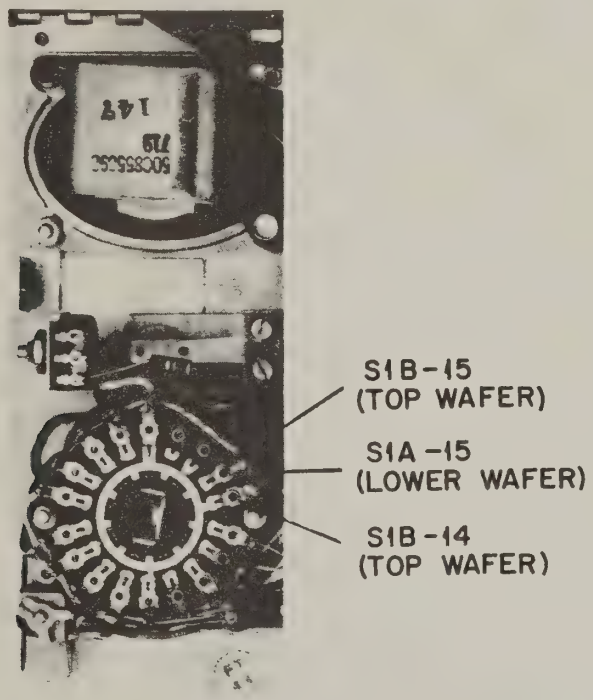
(6) Solder WHT-RED lead to S1B-15.

(7) Solder WHT-BLK lead to S1A-15.

(8) Install batteries with polarity as indicated on battery mounting brackets if the unit is to be self powered. For use with an external power supply refer to information included under paragraph 8, EXTERNAL POWER SUPPLY.

WARNING

Do not discard mercury batteries in fire as they may explode.

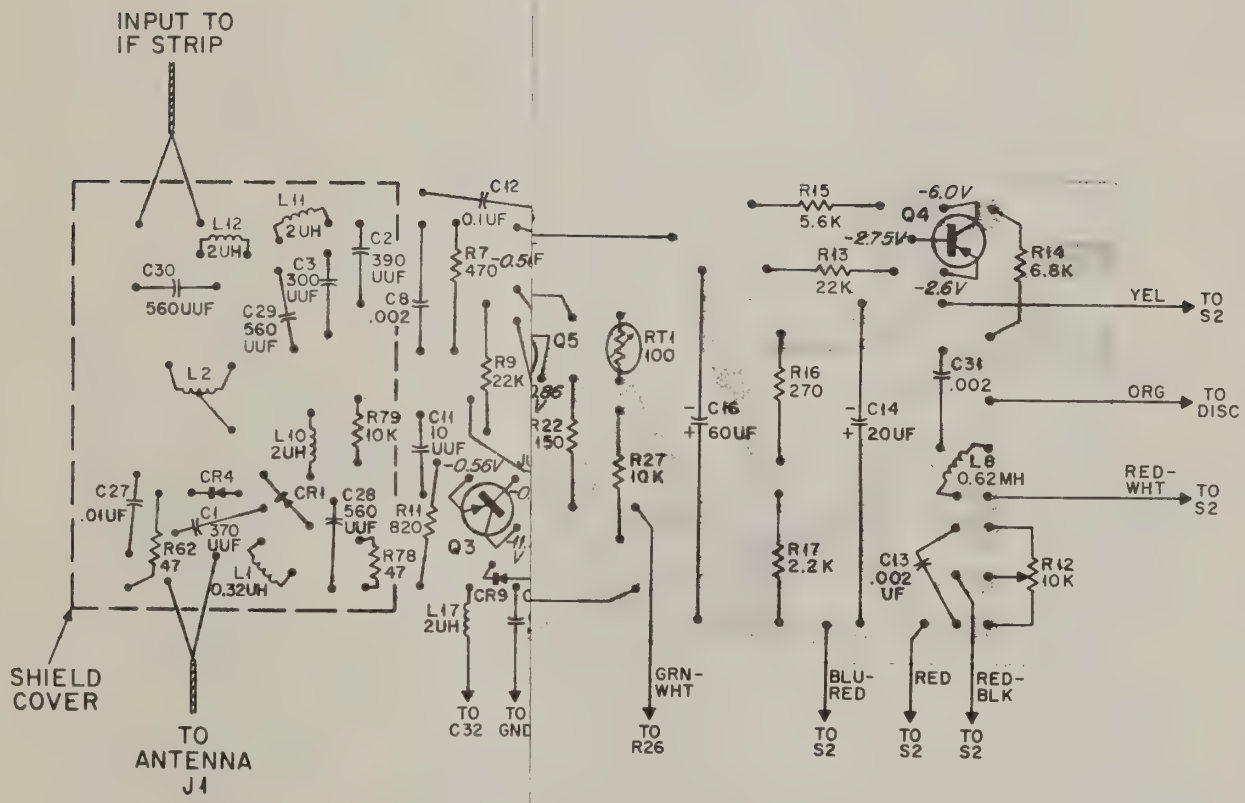


Installation Detail

DEPD-7738-A DEPD-7739-C

REVISIONS

DIAG. ISSUE	BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
A	SLN6059A-2	Q7	WAS SHOWN AS TYPE P-N-P	Q7
			VOLTAGE ADDED	Q1-Q8
B	SLN6059A-3	L18, 19	ADD 24C82190C01 0.148 MH	Q6 AND Q7 EMITTER
C		L6, R8	WERE TRANSPOSED	Q2 COLLECTOR



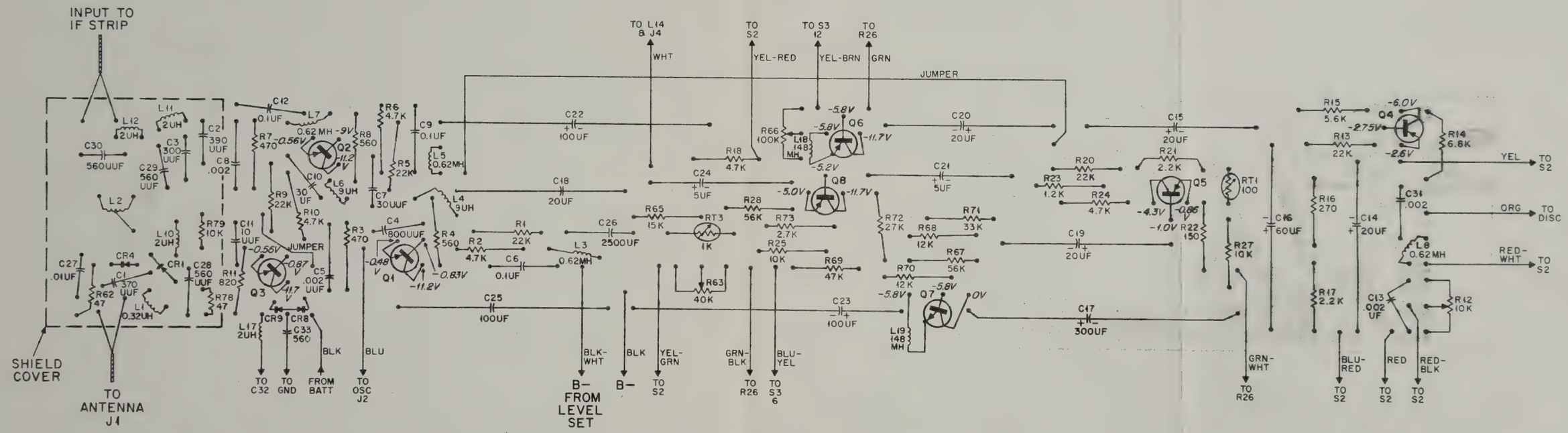
Meter Amplifier Board
Model SLN6059A-3
Printed Board and Wiring Diagram
Motorola No. EPD-7740-C

DEPD-7739-C

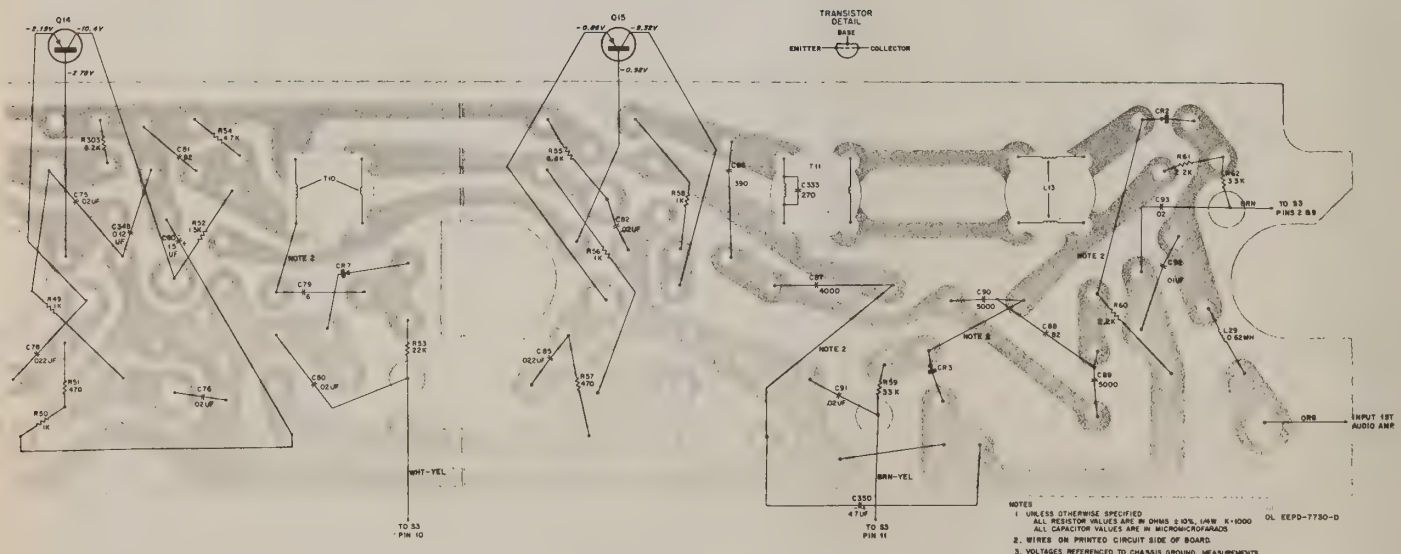
DEPD-7738-A

REVISIONS

DIAG ISSUE	BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
A	SLN6059A-2	Q7	WAS SHOWN AS TYPE P-N-P	Q7
			VOLTAGE ADDED	Q1-Q8
B	SLN6059A-3	L18, 19	ADD 24C82190C01 0.148 MH	Q6 AND Q7 EMITTER
C		L6, R8	WERE TRANSPOSED	Q2 COLLECTOR



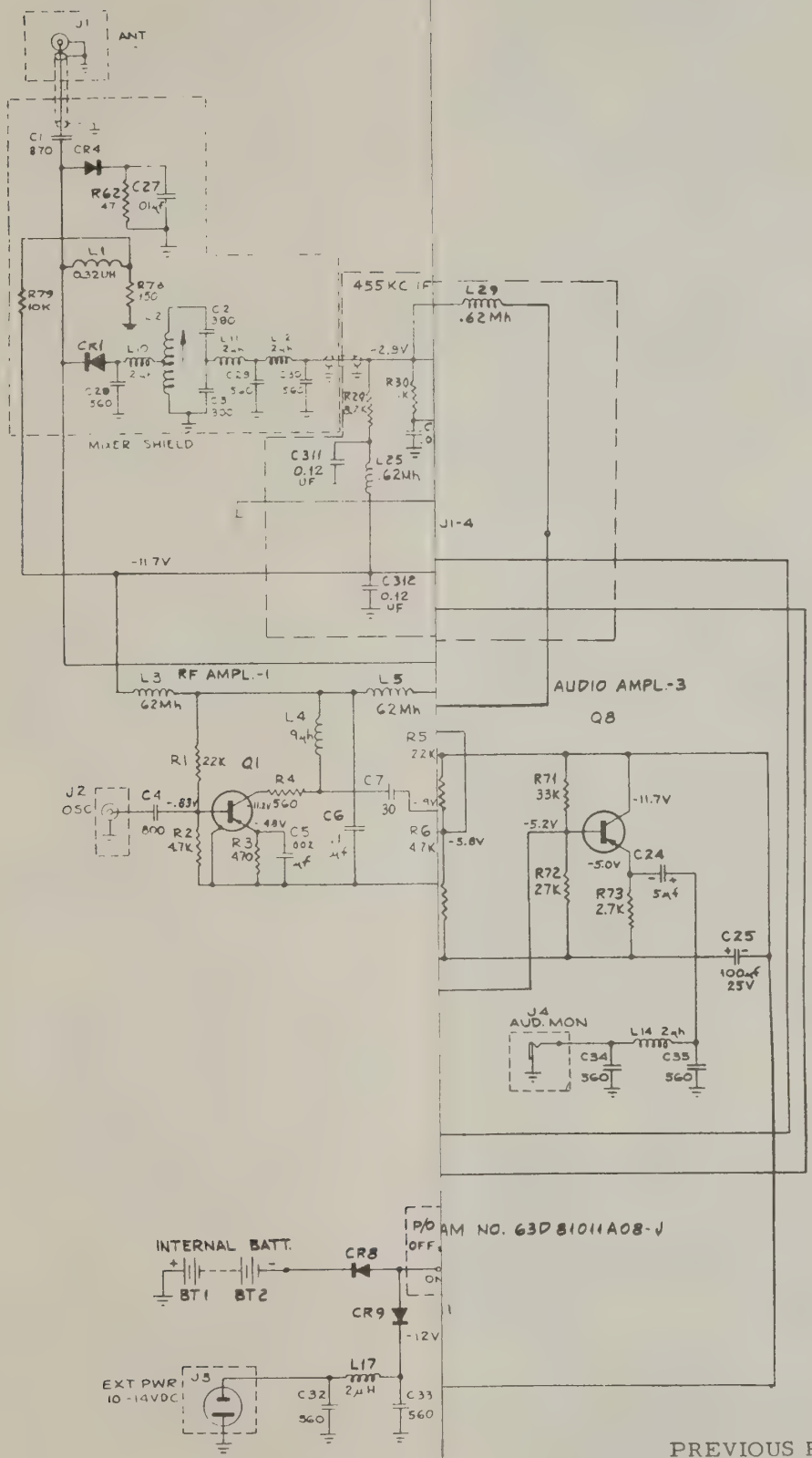
Meter Amplifier Board
Model SLN6059A-3
Printed Board and Wiring Diagram
Motorola No. EPD-7740-C



NOTES

1. UNLESS OTHERWISE SPECIFIED
   ALL RESISTOR VALUES ARE IN OHMS ±10%, 1/4W. K=1000
   ALL CAPACITOR VALUES ARE IN MICROMICROFARADS
2. WIRES ON PRINTED CIRCUIT SIDE OF BOARD.
3. VOLTAGES REFERENCED TO CHASSIS GROUND. MEASUREMENTS MADE IN DEVIATION UNIT WITH NO SIGNAL INPUT. LEVEL SET FULL CLOCKWISE.

OL EEPD-7730-D



PREVIOUS REVISIONS SHOWN
ON BACK OF THIS DIAGRAM

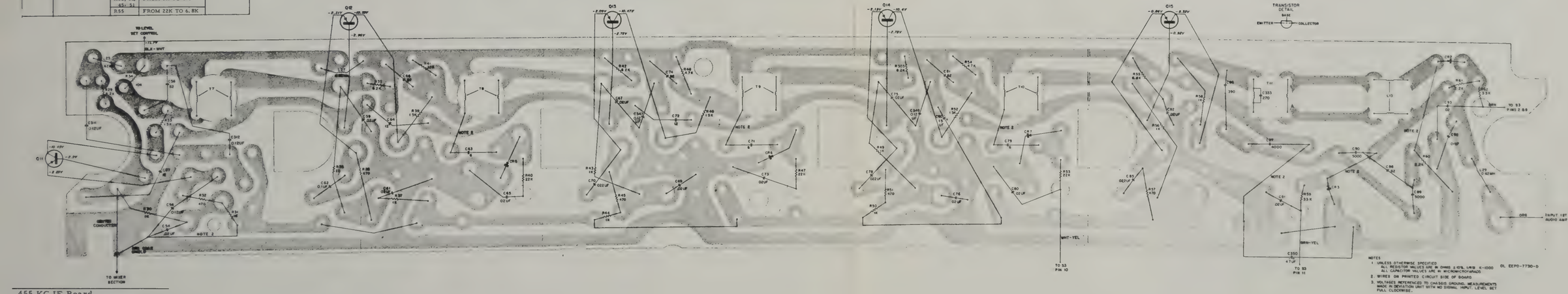
SLN1000A/B Deviation Meter Panel
Schematic Diagram
Motorola No. 63D81011A08-J

REVISIONS

DIAG. ISSUE	BOARD AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
A	SLN6058A		VOLTAGES ADDED	Q11-Q15
B	SLN6058-1	C315	REMOVED 8K844261, 0.1 uf WAS CONNECTED BETWEEN JUNCTIONS R31, L26 AND C311, C312	Q11 CIRCUIT
		L26	REMOVED 24K864737 0.62 mh, WAS CONNECTED BETWEEN JUNCTIONS OF R31, C315, AND R37, C345	Q12 CIRCUIT
		C345	REMOVED 8K844261 0.1 uf WAS CONNECTED BETWEEN JUNCTIONS OF L26, R37 and C65, CR5	
		C346	REMOVED 8K844261 0.1 uf WAS CONNECTED BETWEEN JUNCTIONS OF R44, R50 AND C69, C73	Q13 CIRCUIT
		L28	REMOVED 24K864737 0.62 mh, ONE END CONNECTED AT JUNCTION OF R44 AND R50; OTHER END NOT CONNECTED	
		C84	REMOVED 8K844261 0.1 uf WAS CONNECTED BETWEEN JUNCTIONS OF R56, R57 AND C82, C91	Q15 CIRCUIT
C	SLN6058A2	C56, 311, 312	WAS 8K844261 0.1 uf	Q11 CIRCUIT
		C347		Q13 CIRCUIT
		C348		Q14 CIRCUIT
D	SLN6058A-3	Q11 THRU Q15	WERE AS SHOWN BELOW:	Q11 THRU Q15
		R32, 38, 43, 51	FROM 1K TO 470	
		R55	FROM 22K TO 6.8K	

TRANSISTOR DETAIL

EMITTER BASE SHIELD COLLECTOR OR BASE EMITTER COLLECTOR



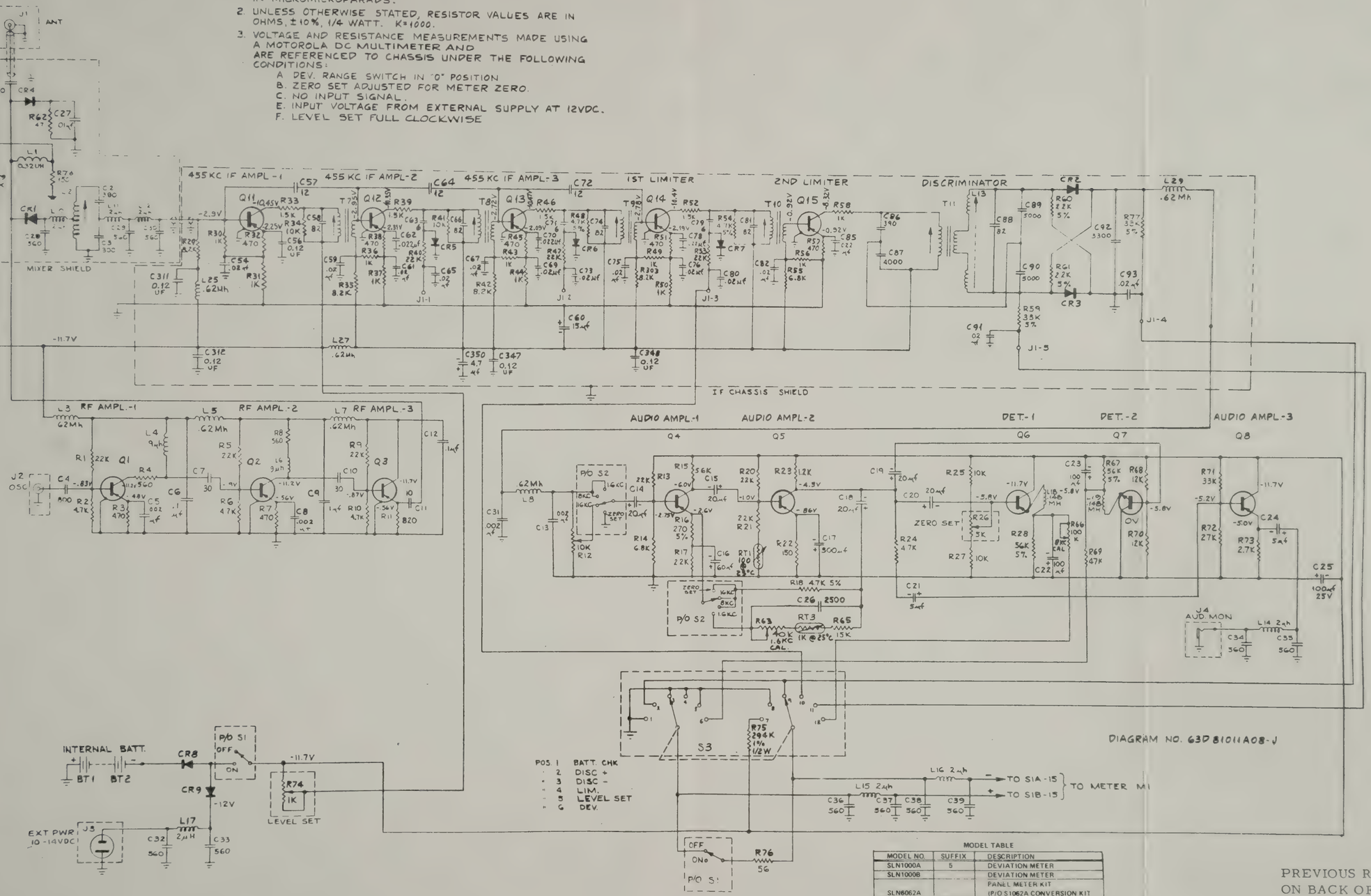
NOTES
1. UNLESS OTHERWISE SPECIFIED
ALL RESISTOR VALUES ARE IN OHMS ±10% 1/4W K=1000
ALL CAPACITOR VALUES ARE IN MICROMICROFARADS
2. WIRES ON PRINTED CIRCUIT SIDE OF BOARD
3. VOLTAGES REFERENCED TO CHASSIS GROUND. MEASUREMENTS MADE IN DEVIATION UNIT WITH NO SIGNAL INPUT; LEVEL SET FULL CLOCKWISE.

OL EXPD-7730-D

455 KC IF Board
Model SLN6058A
Printed Board and Wiring Diagram
Motorola No. EPD-7731-D

NOTES:

1. UNLESS OTHERWISE STATED, CAPACITOR VALUES ARE IN MICROMICROFARADS.
2. UNLESS OTHERWISE STATED, RESISTOR VALUES ARE IN OHMS, ±10%, 1/4 WATT. K=1000.
3. VOLTAGE AND RESISTANCE MEASUREMENTS MADE USING A MOTOROLA DC MULTIMETER AND ARE REFERENCED TO CHASSIS UNDER THE FOLLOWING CONDITIONS:
   - A. DEV. RANGE SWITCH IN "0" POSITION
   - B. ZERO SET ADJUSTED FOR METER ZERO.
   - C. NO INPUT SIGNAL.
   - E. INPUT VOLTAGE FROM EXTERNAL SUPPLY AT 12VDC.
   - F. LEVEL SET FULL CLOCKWISE



POS. 1 BATT. CHK
2 DISC +
3 DISC -
4 LIM.
5 LEVEL SET
6 DEV.

DIAGRAM NO. 63D81011A08-J

MODEL TABLE

MODEL NO.	SUFFIX	DESCRIPTION
SLN1000A	5	DEVIATION METER
SLN1000B		DEVIATION METER
SLN6062A		PANEL METER KIT (P/O S1062A CONVERSION KIT
SLN6046A	1	BATTERY KIT
SLN6046B		BATTERY KIT
SLN6058A	3	455KC IF KIT

PREVIOUS REVISIONS SHOWN ON BACK OF THIS DIAGRAM

SLN1000A/B Deviation Meter Panel
Schematic Diagram
Motorola No. 63D81011A08-J

EFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
6, 311 , 2, 347, 348	8K868890	0.12 uf ±10%; 100 v
7, 64, 72	21D82204B04	12 ±5%; 500 v; NP0
8, 66, 74, , 88	21D82204B05	82 ±5%; 500 v; N2200
0	23K865136	15 uf ±20%; 25 v
2, 70, 78.	8K852472	.022 uf ±10%; 100 v
3, 71, 79	21D82204B03	6 ±0.5 uuf; 500 v; NP0
6	21K859945	390 ±5%; 500 v
7	21K863396	4000 ±1%; 500 v
9, 90	21K857481	5000 ±5%; 100 v
2	8K861939	3300 ±10%; 100 v
50	23K865137	4.7 uf ±20%; 25 v
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
.2, 3	48C855216	germanium
:5, 6, 7	48C82178A01	germanium
		COIL, RF:
3	24K861818	discriminator; YEL; incl 1K867236 CORE, tuning
5, 27, 29	24K864737	0.62 mh; BLK-BRN
		TRANSISTOR: (SEE NOTE)
1, 12, 13, , 15	48R869571	P-N-P; type M9571
		RESISTOR, fixed: ±10%; 1/4 w
9, 35, 42, 3	6K128686	8.2K
0, 31, 36, , 43, 44, 49 , 56, 58	6K127802	1K
2, 38, 45,51	6S127801	470
3, 39, 46, 52	6K127803	1.5K
4, 41	6K129225	10K
0, 47, 53,	6K128685	22K
8, 54	6K129669	4.7K ±5%
5	6S128687	6.8K
7	6K127801	470
9, 77	6K129526	33K ±5%
0, 61	6K129804	2.2K ±5%
		TRANSFORMER, IF:
, 8, 9, 10	24B859891	GRN; incl 1K867236 CORE, tuning
1	24C82842D02	discriminator

SLN6080A Attenuator Kit

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15A82995D01	HOUSING, attenuator
	15A82993D01	COVER, attenuator housing
	9B855268	CONNECTOR, receptable: female; single cont; UG-657/U
	28B82992D01	CONNECTOR, receptacle: male; single contact
	6R114018	RESISTOR fixed: 10 ±5%; 1/2 w; 2 req'd.
	6R5648	RESISTOR, fixed: 51 ±5%; 1/2 w
	29R118191	LUG, soldering
	3S2236	SCREW, machine: #4-40 x 1/8"; 8 req'd.

SKN6007A Cable Kit

	28B844876	CONNECTOR, plug: male; single cont; type BNC; 2 req'd.
	30B475378	CABLE, RF: coaxial; RG-58A/U; 6" req'd.
	28A8201C01	PLUG, phone: male; single contact

SLN6062A/B Panel Meter Kit (p/o S1062A/B Conversion Kit only)

	72B82534D01	METER, d-c: 0-50 microamp; multiple scale

SAN6000A Antenna

	28B82872D02	CONNECTOR, receptacle: male single contact
	43A82839D01	SPACER, insulator
	1V80724A05	ANTENNA ROD AND BALL ASSY.

NOTE:

Replacement diodes and transistors must be ordered by Motorola part number only for optimum performance.

>046A Battery Kit

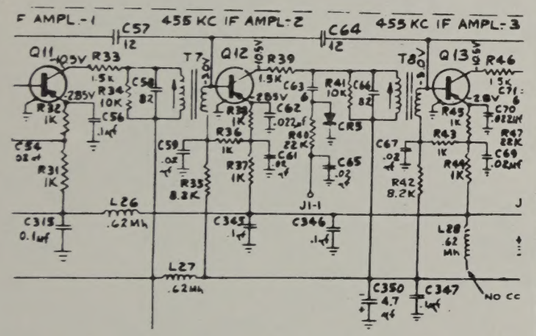
1, 2	60B863919	BATTERY, mercury: 6.5 v; 5 cell; 1000 milliamphrs @ 10 ma max drain

6000A/B Front Panel and Cover Kit

2, 34, 35, 37, 38, 39	21C82187B06	CAPACITOR, fixed: 560 uuf ±10%; 500 v
2	9B855268	CONNECTOR, receptacle: female; single contact
	28A812540	male; 2 contact
	9B82138B01	JACK, phone: single contact
5, 16, 17	24A890687	COIL, RF: 2 uh
		RESISTOR, fixed: 1/4 w; unless otherwise stated:
	18B82700D01	var, 5K
	18D82515B01	var; 1K
	6D82475B50	294K ±1%, 1/2 w
	6K129860	56 ±10%
		SWITCH:
	40A80246	toggle; dpdt
	40C82160H01	rotary; 2 pole; 4 pos; non-shorting
	40C82160H02	rotary; 2 pole; 6 pos; non-shorting

REVISIONS

DIAG. ISSUE	CHASSIS AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
O1	SLN1000A	C25	WAS 50 uf	AUDIO AMPL. 2,3
		L9	REMOVED 0.62 MH	
		R19	REMOVED 560 OHMS	
		RT2	REMOVED 300 OHMS	
		R78	WAS REF. R75	455 KC INPUT
		R79	WAS REF. R76	
		R77	WAS REF. R62	DISCRIMI-NATOR OUTPUT
		C62	WAS 0.1 uf	Q12 EMITTER
		R48, 54	WERE ±10%	PARTS LIST
		T11	WAS 24C82684D02	
		S2	WAS 40A890763	
		S3	WAS 40K893208	
			ADDED MODELS SLN6080A AND SKN6007A	
A	SLN1000A-1	C33	RELOCATED FROM SGN6000A TO SLN6059A	PARTS LIST
			28B82992D01 (MALE) WAS 9B82992D01 (FEMALE)	
		CR1	WAS 48C82583B01	MIXER SHIELD
			POLARITY TRANS-POSED	
		R63	WAS 18K861480 (100K)	Q5
		R64	REMOVED 6K129226 (100K)	
			ADDED SLN6062A PANEL METER KIT	MODEL TABLE
A1			ADDED SAN6000A ANTENNA COMPO-NENTS	PARTS LIST
B	SLN1000A-2		METER AMPL. EYELETED CIRCUIT BOARD REPLACED WITH A PRINTED CIRCUIT BOARD	
D		C84	REMOVED 0.1 uf WAS CONNECTED FROM JUNCTION OF R56, 57 TO GROUND	Q15 EMITTER
		C315, 345, 346, L26,28	REMOVED; CIRCUIT WAS AS SHOWN BE-LOW	455 KC IF AMPLIFIER CIRCUITRY



E	SLN1000A-5	R78	WAS 47 OHMS	CRYSTAL MIXER
		CR1	WAS 48D82116E01	
F	SLN6046A-1	BT-1	ADDED BATTERY CAPACITY TO DESCRIPTION	PARTS LIST
F1	SGN1000A	S2	WAS 40C82830D02	FRONT PANEL & COVER KIT
		S3	WAS 40C82830D01	
G	SLN6058A-2	C56, 311, 312, 347, 348	WAS 8K844261	Q11 EMITTER OFF L25 OFF R42 OFF R303
H	SLN6058A-3	Q11 THRU Q15	FROM 48A134524 TO 48R869571, TYPE M9571	455 kHz IF
		R32, 38, 45, 51	FROM 6K127802, 1K TO 6S127801, 470	
		R55	FROM 6K128685, 22K TO 6S128687, 6.8K	
J	SLN1000B SGN6000B SLN6062B		MODELS ADDED	

PARTS LIST for Schematic Diagram 63D81011A08-J

SLN6059A Meter Amplifier Board Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITOR, fixed: uuf; unless otherwise stated
C1	21K858832	370 ±3%; 500 v
C2	21K859945	390 ±5%; 500 v
C3	21K859944	300 ±5%; 500 v
C4	21K840049	800 ±5%; 300 v
C5, 8	21K837746	.002 uf ±10%; 500 v
C6, 9, 12	21C82372C01	0.1 uf +80-20%; 25 v
C7, 10	21K848156	30 ±5%; 500 v
C11	21K859934	10 ±5%; 500 v
C13, 31	21C855384	.002 uf ±15%; 250 v
C14, 15, 18, 19, 20	23D82601A03	20 uf +100-0%; 25 v
C16	23D82601A02	60 uf +150-10%; 15 v
C17	23D82601A18	300 uf +150-10%; 6 v
C21, 24	23D82601A11	5 uf +33-10%; 25 v
C22, 23, 25	23D82601A09	100 uf +150-10%; 25 v
C26	21K859773	2500 ±5%; 500 v
C27	21K832501	.01 uf +60-40%; 250 v
C28, 29, 30, 33	21C82187B06	560 ±10%; 500 v
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
CR1	48D82116E02	silicon
CR4	48B811119	germanium
CR8, 9	48C848523	germanium
		COIL, RF:
L1	24A835456	0.32 uh
L2	24C82842D01	inductor
L3, 5, 7, 8	24K847940	0.62 mh
L4, 6	24B847920	9 uh
L10, 11, 12, 14	24A890687	2 uh
L18, 19	24C82190C07	0.148 mh
		TRANSISTOR: (SEE NOTE)
Q1, 2, 3	48R869017	P-N-P
Q4, 5, 6, 8	48A124327	P-N-P
Q7	48A124362	N-P-N
		RESISTOR, fixed: ±10%; 1/4 w; unless otherwise stated
R1, 5, 9, 13, 20	6K128685	22K
R2, 6, 10, 24	6K127804	4.7K
R3, 7	6K127801	470
R4, 8	6K129620	560
R11	6K129432	820
R12	18K864068	var; 10K
R14	6K128687	6.8K
R15	6K129433	5.6K
R16	6K131525	270 ±5%
R17, 21	6K128689	2.2K
R18	6K129669	4.7K ±5%
R22, 78	6K129862	150
R23	6K129235	1.2K
R25, 27, 79	6K129225	10K
R28, 67	6K128684	56K ±5%
R62	6K129233	47
R63	18B82567D02	var; 40K ±20%; 1/8 w
R65	6K127805	15K
R66	18K861480	var; 100K
R68, 70	6K129230	12K
R69	6K128902	47K
R71	6K127807	33K
R72	6K127806	27K
R73	6K128688	2.7K
		THERMISTOR:
RT1	6B859701	100 ±10%; at 25°C
RT3	6B858402	1K ±10%; at 25°C

SLN6058A 455 KC IF Kit

		CAPACITOR, fixed: uuf; unless otherwise stated
C54, 59, 61, 65, 67, 69, 73, 75, 76, 80, 82, 91, 93	21B82428B01	.02 uf GMV +100%; 100 v
C56, 311, 312, 347, 348	8K868890	0.12 uf ±10%; 100 v
C57, 64, 72	21D82204B04	12 ±5%; 500 v; NP0
C58, 66, 74, 81, 88	21D82204B05	82 ±5%; 500 v; N2200
C60	23K865136	15 uf ±20%; 25 v
C62, 70, 78, 85	8K852472	.022 uf ±10%; 100 v
C63, 71, 79	21D82204B03	6 ±0.5 uuf; 500 v; NP0
C86	21K859945	390 ±5%; 500 v
C87	21K863396	4000 ±1%; 500 v
C89, 90	21K857481	5000 ±5%; 100 v
C92	8K861939	3300 ±10%; 100 v
C350	23K865137	4.7 uf ±20%; 25 v
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
CR2, 3	48C855216	germanium
CR5, 6, 7	48C82178A01	germanium
		COIL, RF:
L13	24K861818	discriminator; YEL; incl 1K867236 CORE, tuning
L25, 27, 29	24K864737	0.62 mh; BLK-BRN
		TRANSISTOR: (SEE NOTE)
Q11, 12, 13, 14, 15	48R869571	P-N-P; type M9571
		RESISTOR, fixed: ±10%; 1/4 w
R29, 35, 42, 303	6K128686	8.2K
R30, 31, 36, 37, 43, 44, 49 50, 56, 58	6K127802	1K
R32, 38, 45, 51	6S127801	470
R33, 39, 46, 52	6K127803	1.5K
R34, 41	6K129225	10K
R40, 47, 53,	6K128685	22K
R48, 54	6K129669	4.7K ±5%
R55	6S128687	6.8K
R57	6K127801	470
R59, 77	6K129526	33K ±5%
R60, 61	6K129804	2.2K ±5%
		TRANSFORMER, IF:
T7, 8, 9, 10	24B859891	GRN; incl 1K867236 CORE, tuning
T11	24C82842D02	discriminator

SLN6046A Battery Kit

		BATTERY, mercury:
BT1, 2	60B863919	6.5 v; 5 cell; 1000 milliamphrs @ 10 ma max drain

SGN6000A/B Front Panel and Cover Kit

		CAPACITOR, fixed:
C32, 34, 35, 36, 37, 38, 39	21C82187B06	560 uuf ±10%; 500 v
		CONNECTOR, receptacle:
J1, 2	9B855268	female; single contact
J3	28A812540	male; 2 contact
		JACK, phone:
J4	9B82138B01	single contact
		COIL, RF:
L15, 16, 17	24A890687	2 uh
		RESISTOR, fixed: 1/4 w; unless otherwise stated;
R26	18B82700D01	var; 5K
R74	18D82515B01	var; 1K
R75	6D82475B50	294K ±1%, 1/2 w
R76	6K129860	56 ±10%
		SWITCH:
S1	40A80246	toggle; dpdt
S2	40C82160H01	rotary; 2 pole; 4 pos; non-shorting
S3	40C82160H02	rotary; 2 pole; 6 pos; non-shorting

SLN6080A Attenuator Kit

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
	15A82995D01	HOUSING, attenuator
	15A82993D01	COVER, attenuator housing
	9B855268	CONNECTOR, receptable: female; single cont; UG-657/U
	28B82992D01	CONNECTOR, receptacle: male; single contact
	6R114018	RESISTOR fixed: 10 ±5%; 1/2 w; 2 req'd.
	6R5648	RESISTOR, fixed: 51 ±5%; 1/2 w
	29R118191	LUG, soldering
	3S2236	SCREW, machine: #4-40 x 1/8"; 8 req'd.

SKN6007A Cable Kit

	28B844876	CONNECTOR, plug: male; single cont; type BNC; 2 req'd.
	30B475378	CABLE, RF: coaxial; RG-58A/U; 6" req'd.
	28A8201C01	PLUG, phone: male; single contact

SLN6062A/B Panel Meter Kit (p/o S1062A/B Conversion Kit only)

	72B82534D01	METER, d-c: 0-50 microamp; multiple scale

SAN6000A Antenna

	28B82872D02	CONNECTOR, receptacle: male single contact
	43A82839D01	SPACER, insulator
	1V80724A05	ANTENNA ROD AND BALL ASSY.

NOTE:

Replacement diodes and transistors must be ordered by Motorola part number only for optimum performance.

Portable Test Set

68P81011A01-K

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